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MIGRATION OF THE PACIFIC PLOVER TO AND FROM THE HAWAIIAN ISLANDS.

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SINCE primitive times the phenomenon of Bird Migration has excited peculiar interest, and although much of the mystery formerly attaching to it has been dispelled by the prosaic facts brought to light by modern investigations, it still presents enigmas to stimulate the imagination and invite study. *How* birds migrate is now beginning to be understood, and the present practice of tabulating dates of arrival and departure and collating the facts gathered by numerous observers in different parts of the country is likely ere long to give us the solution of many as yet unsolved problems. *Why* birds migrate is quite another question, likely to resist satisfactory solution for some time to come if, for no other reason, than from the very nature of the case we can have comparatively few facts to guide us, and speculation must largely take the place of deduction.

When we consider the number of miles traveled, the widely different characters of the regions chosen for summer and winter abodes, and the perils necessarily attending the passage between them, the migration of no other of our birds appears so wonderful as that of the Golden Plover. In part the migration route of the eastern form of the Golden Plover (*Charadrius dominicus*) is well understood, and those interested in the subject are referred to a sug-

gestive paper by Austin H. Clarke¹ on the probable method by which the bird is guided safely across the Atlantic from Nova Scotia to South America. In the present paper will be presented such facts in regard to the migration of the Pacific Plover (*Charadrius dominicus fulvus*) as the author was able to gather during his stay in the Hawaiian Islands — from 1894 to 1904, together with certain deductions therefrom.

Isolation of the Hawaiian Islands.— It may be premised that no other part of the earth's surface is so far distant from continental areas as the Hawaiian Archipelago. The islands are about 2000 miles from the coast of California on the east; about the same distance from the Aleutians on the north, and the Marquesas group on the south; and not much further from Japan, reckoning from the outermost of the chain of low islands and reefs which stretches from Hawaii some 700 miles towards the Asiatic coast. It is important to note, however, that, assuming the availability of these islands as stepping stones for birds, there would still be an interval of more than 2000 miles between the most northwestern of the chain and Japan. Hence, if we reject as untenable the theory of a sunken southern continent, of which the Hawaiian Archipelago is the northernmost and now the only visible remains, the original introduction into Hawaii of its mammals, birds, insects and plants presented greater difficulties than were presented to the fauna and flora of any other part of the world.

So remote and isolated have these islands been since their formation, and so few and uncertain Nature's carrying agencies — the birds, the winds, and the ocean currents — that after the islands were thrust up out of the sea ages must have elapsed before they received the parent stocks of the many and diverse forms of plant and animal life peculiar to them.

That the difficulties of stocking the archipelago with life, great as they must have been, were not insurmountable is proved by the fact that enough waifs found their way to the islands to clothe them with verdure and stock them with animal life. As a result of the competitive struggle which followed upwards of 900 species of plants, numerous insects, including many distinct genera, seven

¹ Auk, 1905, pp. 134-140.

species of lizards, more than fifty species of birds, and at least two mammals, finally made good their foothold on the islands and flourished, some more, some less, according to their nature and adaptability.

Avifauna of the Hawaiian Islands.—Among other inhabitants of the islands are some 45 species of passerine birds, one hawk, an owl, a mud hen, a gallinule, a stilt, a duck, a goose, and a few others. All of these I pass by for the moment, and come to certain migrants from North America which regularly journey between the islands and the continent both spring and fall. Four of these migrate in great numbers, viz., Golden Plover, Turnstone, Wandering Tattler, and Bristle-thighed Curlew; the Shoveller Duck and Pintail also visit the islands in considerable numbers. In addition to these are perhaps a dozen other ducks and geese whose occurrence in the islands is more or less casual, and the same remark applies to a dozen or fifteen wading birds. Altogether, including the regular migrants, the casuals, and the accidentals, the visiting birds make quite a respectable winged army.

Islands accidentally discovered by present migrants.—It is not supposable that birds ever put to sea to seek unknown lands by a hitherto untraveled route. We know that millions of birds of many species are annually, or semiannually, driven out to sea by storms, especially species that migrate near the sea coast. Many, perhaps most, of these storm-driven waifs never see land again, but become wing weary and find watery graves. Some few, however, reach safe havens in oceanic islands, and in this way no doubt such islands have received their bird colonists.

That the Golden Plover, like the other migrants from the North American coast, discovered Hawaii accidentally is hardly open to doubt. I see no necessity for presupposing the existence of sunken continents, or of ancient continental extensions, to account for the presence on the islands of the Plover and other North American birds, like the Night Heron, Gallinule, and Coot. The presence there of the weak-winged passerines is another matter, and it must be admitted that proof of the existence of an ancient continent stretching from the islands southward towards Australia would simplify a very difficult problem. So far, however, as our North American birds are concerned, it need be assumed only that long

ago some thousands of Pacific Plover and other species, when following the usual southward migration route along the Asiatic coast in fall were accidentally driven to sea, and that a greater or less number were able to maintain themselves on the wing long enough to make a lucky landfall of the low islands to the northwest of Hawaii. The flight from Japan to the nearest island eastward would involve a flight about as prolonged as that from the Aleutian Archipelago to Hawaii, or some 2000 miles. The chain of low islets once gained, it would be but a question of time for migrants, step by step, to reach the larger islands of Hawaii, 2000 miles or so to the eastward. After wintering, a sufficient number may have essayed the flight back across the ocean to the Asiatic coast the following spring, and then northward to their Siberian breeding grounds with their Asiatic fellows. Having once discovered the islands and learned their suitability as winter quarters, they would no doubt return over the same route, and thus in time establish a regular fly line or migration route from the Asiatic mainland to the islands. Later, as the position of the islands became better known, the part land, part water route would naturally be exchanged for a shorter all water route. It is possible, however, that the old Asiatic route has never been wholly abandoned, and that it is still favored by a certain number of the island migrants; for plover, turnstones, curlew and tattlers have been observed on Laysan, about 600 miles northwest of Hawaii, late in May. These birds were probably about to migrate, but it is of course impossible to tell whether they were headed directly for America or for America via Asia.

Absence of fog.—The original discovery of the Hawaiian Islands by birds was undoubtedly greatly facilitated by the fact that, although fog is common on the mountains at altitudes of 5000 feet and upwards, it never occurs at sea level; and as its absence favored the original avian discoverers so it continues to favor annual migrants.

Date of discovery of the Islands by American migrants.—As to the length of time the Pacific Golden Plover and its fellow migrants have been visiting the Hawaiian Islands, or when they first discovered the group, it were idle to speculate. Their arrival probably antedated by thousands of years that of the Natives, which is supposed to date back only some twenty centuries. Certain of

the bird colonists from America, like the owl, night heron, gallinule and coot, have resided in the islands so short a time that they have changed very little from their American ancestry. Others, like the hawk, stilt, and goose, have changed more, and hence presumably have been residents of Hawaii a longer time. Changes of color, proportion, and size, however, be they great or small, cannot be used as time measures, except in the vaguest way, since practically next to nothing is known of the length of time they require. We are perhaps justified in concluding that none of the above species have changed sufficiently to call for isolation from their American ancestors for periods to be reckoned by geologic intervals rather than by thousands of years.

Spring migration of Plover.—The impulse to migrate in spring is by no means simultaneous among all the plover that winter in the islands, or that winter on any one island; nor apparently is it the rule for large bodies of plover to migrate together. The plover and turnstones, probably often in mixed companies, begin to leave for the north early in April, and the migration continues till at least the latter part of May (probably even later), being dependent apparently on the state of preparedness, or the inclination of individual birds.

When the time to migrate comes, small parties, from a dozen or even less, to flocks of 200 or more, strike boldly out to the northward, apparently without hesitancy or doubt of the result. Mr. Haswell of Papaikou, which is on the coast about 15 miles north of Hilo, soon after daybreak during the early days of April, 1900, saw several flocks rise to a great height and, after widely circling about a few times as if to orient themselves, finally disappear in a northerly direction.

It is probable, however, that day migration is not the rule with plover and other shore birds. Apparently it is more usual for the flocks to feed by day and leave just before nightfall, as do many other birds in different parts of the world. Mr. R. C. L. Perkins states that several times he "witnessed these departures always late in the afternoon, or just before dark." He adds: "When about to return to the north the plover frequently assemble in very large flocks, and before setting out on their journey, rise to an enormous height in the air, even beyond the range of sight. I have

once seen two such flocks start from the same point, the one following the other after an hour's interval." (Fauna Hawaiiensis, Vol. I, pt. iv, p. 449, 1903.)

It is interesting to note that plover are occasionally sighted from passing ships. Naturally they attract little attention and never are recorded in the ship's log. I found one ship captain, however, who remembered to have seen a flock of plover passing north in spring. The date was uncertain but the ship was about midway between San Francisco and Hawaii, and the plover were steering a course which would carry them to the neighborhood of the Aleutians.

Where data are so scarce and difficult to obtain it is worth noting, as bearing on the season and course of the spring migration of island birds, that Townsend captured a Pacific Plover, which boarded the 'Albatross' May 19, 1890, when 600 miles south of Kadiak. This bird was probably an island migrant nearing the end of its long flight. Elliott, also, speaking of the turnstone, states that he "met with it at sea 700 miles from the nearest land, flying northwest towards the Aleutian Islands, my ship being 800 miles west of the Straits of Fuca."

Physical condition of spring migrants.—During the last two months of their stay in the islands both the migrating plover and turnstones get very fat, and it is probable that individuals that are not in good condition do not attempt the flight, or if they do, do not survive the attempt. Towards April most plover seem to be in full breeding plumage, and I feel sure that none of the birds assuming the breeding dress remain behind, unless sick or wounded. There is, however, a small contingent, both of plover and turnstones, that summer in the islands, and these appear to consist wholly of immature individuals, which, as a rule, are thin and not in good trim.

Speed of migrating Plover.—The migration of plover over a wide ocean involves two factors: (1) Ability to go without food for the time necessarily consumed in the flight. (2) Ability to make the journey without resting and yet not overtax the physical powers. As stated above, apparently all the migrating birds in spring are in good order, and some of them, especially the males, are exceedingly fat. They are thus in condition to exert their utmost powers for a considerable period and to do without food. I know of no actual tests of the speed of plover. From my own observations

I believe that when not fatigued the plover can easily enough fly 50 to 75 miles an hour, but it is doubtful if such speed can be maintained for any great length of time. I am confident, however, that a speed of 40 miles an hour is well within the bird's powers. At this rate the flight from Hawaii to the Aleutians, a distance of about 2000 miles, would consume a little more than two days; or, allowing a speed of 35 miles an hour, the time occupied would be two days, 9 hours. At first thought it does not seem possible for plover to fly continuously for so many hours without rest and food; yet the above statement cannot be far from the truth. If the birds fly faster, the journey requires less time but the expenditure of more vital force; if, slower, they husband strength at the cost of time. In either event the result would be about the same. Of the extreme limit of the plover's endurance in continuous flight we know nothing; nor do we know what proportion of the birds that start across the ocean are successful in making the flight. That the effort is too much for many individuals is hardly to be doubted, especially for young of the year, which are comparatively weak and unpractised of wing.

A leaf from the notebook of Dr. E. A. Mearns is of interest in this connection. On the 9th of October, when on a transport bound for San Francisco, and one day out of Honolulu, Mearns noticed a lone plover, which joined company with the ship for nearly two days. On the 10th his note book records that the bird was still circling around and above the ship, as if designing to come aboard. Sometimes it flew close alongside and whistled plaintively. Once it rose very high in air and flew out of sight, probably trying to sight land on which to rest, but it soon returned from its fruitless quest. At 5 p. m. on the 10th it seemed weak and tired, but was still flying feebly alongside, its call notes continually growing fainter with waning strength. It was lost sight of at dusk, and was never seen again, but its fate is only too certain.

It may seem remarkable that this tired wanderer apparently never alighted on the water to rest. However, I recall only one instance in which an unwounded plover has been known to alight on the water and again take wing.¹ In considering this question it

¹ Rothschild, *Avifauna of Laysan*, pt. 1, xiv, 1893.

must not be forgotten that neither by birth nor habits is the plover a swimmer. It is a true wader, and though, like all of its family, it can swim when compelled to and can even alight on smooth water and again take wing, it does so probably only in very exceptional instances, and perhaps never when in migration.

Could we assume that this particular individual made a direct course from the Aleutians to the point where intercepted by the transport, the incident would be valuable as affording a tolerable idea of the limit of the endurance and wing power of a plover. The bird, however may have lost its way and have taken a very indirect course to the point where it was first seen from the ship. Unaware of the proximity of the islands to which it was bound, and which it might have reached in a few hours more, it became confused, and made the fatal mistake of following the ship's course. Before it finally succumbed to fatigue, it followed the ship for about 500 miles. Thus at the least calculation it flew 2500 miles before it succumbed to fatigue, and probably very much further.

Time of arrival of migrants in Alaska.—As the migration of the plover (and also the turnstone) from the islands begins during April and continues till into May, and possibly even later, the birds should arrive in Alaska at corresponding dates, the flight probably consuming not much more than two days. As a matter of fact, however, the mainland breeding grounds of the plover in Alaska are snow bound till well into May, and Turner states that the Pacific Plover does not arrive at St. Michael till about June 1, a statement corroborated by Nelson. Although there is no necessary precise correspondence between the breeding time of the Pacific Plover in Siberia and in Alaska, it is interesting to note the statement of Seebohm that the plover arrives on the Yenesei River, Siberia, June 5; and, referring to water birds generally, he adds that "very few eggs are laid on the tundra before the last week of June." (Geog. Dist. of the Charadriidæ, 1888, p. 58.) Where the plover and turnstone, which leave Hawaii early in April, spend the interval till the melting snow bares the hillsides in Alaska and exposes the previous season's crop of *Vaccinium* and *Empetrum* berries, upon which the plover in spring chiefly feed, is left to conjecture. As the Aleutian chain is nearly 1200 miles long, however, and as comparatively little is known of its birds in spring, it is possible that early

migrating shore birds sojourn on them until advancing summer prepares the mainland for their occupancy. This conjecture is to some extent supported by the statement by Elliott that a few straggling plover land on the Pribilofs in April, or early in May, on their way north to breed, but never remain long.

Breeding range of the Golden Plover.— Without doubt the chief breeding ground of the Pacific Plover is eastern Siberia, but a considerable number breed on the American coast of Bering Sea from the vicinity of Bristol Bay (where taken by McKay at Nushagak, June, 1881) to near Bering Straits. The plover breeding on Kotzebue Sound, north of the Straits, is *dominicus* (Grinnell), as also is the one breeding at Point Barrow (Murdock). Apparently *fulvus* does not breed at all in the interior of Alaska, these regions being occupied solely by *dominicus*. It concerns us to note in passing that, unless Palmén is mistaken in his identification, *dominicus*, not content with its wide habitat in the interior of Alaska, crosses the Straits, and breeds on the Chukchi Peninsula.¹ Thus the summer ranges of the two forms actually inosculate, the Asiatic form crossing to America and the American form crossing into Asia — an apparent anomaly in the case of geographic forms.

Hawaiian Plover breed in Alaska.— It is of course impossible to absolutely identify the Pacific Plovers breeding on the coast of Alaska with the winter visitors to Hawaii, yet there are certain facts tending to show that they are the same. (1) It is to be noted that of the winter visitors to the Hawaiian Islands not one is an exclusively Asiatic species. (2) The form of the Wandering Tattler which regularly migrates to and from the Islands is not the Asiatic form *brevipes* but the American form *minor*. (3) There is evidence that the Bristle-thighed Curlew, also a winter visitor to the islands, breeds in Alaska, while it is not known to breed in Asia. As the two last named birds, which breed exclusively in America so far as known at present, regularly winter in the islands, it is a fair inference, in the lack of evidence to the contrary, that the plover and turnstone, as also the other waders which winter casually in the islands, as the Sanderling, Pectoral Sandpiper, Sharp-tailed Sandpiper, Jack Snipe, Knot and others, also come from Alaska and not from Asia.

¹ Palmén, Vega-Exped. Vetensk. Iak-t., Vol. V, 1887, p. 342-348; also Stejneger Auk, 1888, pp. 308-310.

Fall migration of Plover.—For some reason or other plover appear to arrive in the Commander Islands in fall very late, according to Stejneger, not till after the 15th of September; the last ones were observed in 1883 on the 28th of October. The turnstone on the other hand touches the Commanders on its return trip much earlier, according to the same author, as early as the last part of July.

Arrival of Plover in Hawaii in Fall.—Passing now to Hawaii, a small number of plover and also turnstones return there as early as the middle, or the latter part, of August. By inference these are the birds which leave for the breeding grounds earliest in spring, and so are the first to complete their parental duties. Or, the first arrivals in Hawaii may be individuals which made the journey to Alaska but for some reason did not breed; or whose nests were broken up; or whose mates were killed, for the Arctic tundras have their bird tragedies as have other lands. Just as the turnstones reach and leave the Pribilofs in small straggling flocks, so they and the plover arrive in Hawaii; and it appears further that in fall, as in spring, they get into good condition for the flight, and then leave in no regular order nor at any set time, but just as the impulse seizes them.

Between the dates of early departure from Hawaii in spring and of early arrivals in fall there is thus an interval of some four months or more, quite long enough to permit the pairs to attend to their parental duties, to get into condition for the return journey, and to make the trip. So far as my observations extend all the first arrivals in Hawaii in fall, both plover and turnstone, are adults in breeding plumage. I may add that they are invariably in good flesh and that some are very fat. Later arrivals, however, no doubt young of the year, are comparatively poor in flesh and require considerable time to fatten.

How migrants find their way across the ocean.—It thus appears that thousands of birds, large and small, make a two thousand mile flight from Alaska to Hawaii in fall and return in spring. To answer the question how they find their way across the trackless waste we must leave the realm of fact and enter that of speculation. Ocean migration routes have generally been plausibly accounted for on the theory that the present fly lines were established ages ago

when the land connections were very different, and when, by means of continental extensions and islands now sunken, part land, part water routes were easily followed. As such changes as the raising or depressing of continents are very gradual and extend through long periods, succeeding generations of migrants are supposed to have scarcely noticed the difference, and, even after the old land marks had disappeared, to have been able to follow the ancient routes through the power of transmitted habit.

This explanation, however, does not apply to the case of the Hawaiian migrants, since there is no reason to suppose that the isolation of the Hawaiian Islands in relation to continental areas was ever less complete than now; and, although a theory has been advanced that the archipelago is the northern apex of a former southern continent, it finds little support from biologic, botanic, or hydrographic investigations. Moreover, such a continent extending southward towards Australia would have been of no assistance to birds migrating from America, though its former existence, could it be proven, would render easy the explanation of the derivation of the Australian elements of the Hawaiian fauna and flora. The presence of two shoals, situated, roughly speaking, midway between San Francisco and Hawaii, has suggested the former existence here of large islands now sunken. If such islands really existed, which is doubtful, they unquestionably would have aided the passage of American birds and plants to the Hawaiian Islands.

In his interesting article on 'The Migration of Certain Shore Birds' quoted above, Mr. Clark argues that prevailing winds, especially the steady trades, offer a reasonable explanation of the way certain birds are, or may be, guided in migrating. Such an explanation seems to apply peculiarly to the case of the American Golden Plover which, as is well known, abandons the North American continent at Labrador and Nova Scotia, and, under ordinary circumstances, makes no landfall till it strikes the Guiana coast, a distance of about 2000 miles. It is perhaps more remarkable that, instead of returning in spring to its breeding grounds by the same route it takes in fall to its winter quarters, it follows an all land route, and traverses the length of two continents, thus furnishing the most extraordinary migration route of any existing bird, as pointed out by Professor Cooke.

An attempt to apply to the case of the Pacific Plover wintering in Hawaii the same principles so well worked out for the Atlantic coast form is not so successful. About September the wind that prevails in the North Pacific immediately south of the Aleutians is from the northwest. It is generally believed that migrating birds prefer to fly on a beam wind. By heading southwest birds migrating to Hawaii might have the northwest wind abeam till about the neighborhood of latitude 30° where they would be almost sure to pick up the northeast trades. By then changing their course to southeast they would be enabled to fly with wind abeam till they sighted the islands. That they follow such a course in fall and steer their course by either the northwest wind or the northeast trades, there is not a particle of proof that I can bring forward; nor do I know any facts to justify a statement that they do or do not utilize the winds as guides either in fall or in spring.

The results of recent experiments by Prof. John B. Watson with Sooty and Noddy Terns along our south Atlantic coast go far to prove the contention long maintained by many that birds actually possess a sense of direction, tantamount to a sixth sense. If we grant this, as we may ultimately be compelled to do, the ability of birds to find their way both by land and sea is explained without further trouble, and quite independently of landmarks of any kind or of the winds. The possession of such a useful sense will explain many difficult problems of migration, and among others the apparent confidence with which migrants boldly launch out from Hawaii for a 2000 mile flight across the Pacific, without the aid of any compass apparent to human intelligence.

Danger of oceanic migration.—Of the fall migration of the Golden Plover on the Atlantic it may be remarked that while the birds have no landmarks to steer by after leaving the northeast coast, they are yet within comparatively easy flight of the mainland, and, in event of a bad northeastern wind, they can, and in fact often do, take refuge on the New England coast; and further on, in bad weather or in case of unpropitious winds, they alight for rest and food in the West Indies.

The Pacific Plover traverses a much more hazardous route since, when once clear of the Aleutian Islands, it not only leaves all landmarks behind but also all ports of refuge. The Hawaiian Archi-

pelago, with the chain of low islands and sand spits to the northwest afford a reasonable chance for a successful landfall, since unitedly they stretch away in a very thin line for some 2200 miles. Moreover the islands are close enough together so that migrants high in air would not be likely to miss them by passing between. Flocks that chance to get to the eastward of Hawaii, however, are probably doomed, since they would have to fly another thousand miles or so before finding islets on which to rest. The Marquesas group, the first islands of size to the south of Hawaii, is about 2000 miles away, or about 4000 miles from the Aleutians, and it is more than doubtful if even the strong winged plover could fly 4000 miles without rest and food and survive the trip. That many of the migrating shore-birds actually perish at sea admits of no doubt.

In this connection it is of interest to note that in the few instances in which island migrants have been sighted when near their journey's end, going or coming, they exhibit fatigue, and usually evince a strong desire to board passing vessels. The incident noted by Dr. Mearns has been cited. Other instances were reported to me by the captains of two island bound barks who sighted several small flocks of plover during the last days of September, 1900, when from 200-400 miles off Hilo. These birds appeared much fatigued and exhibited a strong desire to board the ships, especially when their calls were imitated.

E. W. Nelson, however, while on the 'Corwin,' October, 1881, saw a small party of plover about midway between the Alaska Peninsula and the Hawaiian Islands. These birds were headed directly for the islands and they flew swiftly on their course, showing no signs either of uncertainty or of fatigue.

Moult of the Pacific Golden Plover.— It is of interest to note that in fall this plover migrates before it moults; in spring it moults before it migrates. The first birds to reach the archipelago in August are, as stated, adults, and while they are practically in full breeding dress they begin to moult into the winter dress almost at once. The moulting season for the species is long, and many individuals, doubtless birds of the year, may be found the last of December still moulting into the fall and winter dress. By the middle of February numerous individuals are already beginning to moult a second time and to assume the distinctive nuptial plumage,

which, in the case of these early birds, is practically completed during the month of March, though individuals continue to moult far into April and some no doubt complete the final stages in Alaska.¹ Doubtless the individuals to moult first in spring are the adults which arrive first, and finish the fall moult first; and doubtless, too, these are the birds first to leave Hawaii for their breeding grounds in Alaska. So protracted is the moult of the species that it is probably true that during the stay of this plover in Hawaii — from middle August till May — there is not a month when some individuals are not moulting.

There is no reason for believing that the plover summering in the islands which, as before stated, are chiefly if not wholly immature birds, participate in the spring moult. At all events the Hawaiian summer plover and turnstones that I have seen were, without exception, in the winter garb.

Why the Plover migrates.— We have thus seen that what at first might appear a physical impossibility — the 2000-mile flight of small birds across an ocean highway, without a single landmark and with only the friendly winds to guide them, if indeed, they utilize these as guides — is not only possible, but the feat is accomplished annually by many thousands of individuals, and that too apparently with no stops for rest and food. The wonder of it is but increased when we realize that these annual flights are undertaken solely for the purpose of making a sojourn of a few brief weeks in Alaska to nest and rear their young. The hazards of such journeys are very great — much greater than any land migration however prolonged — and there is no doubt that of the thousands daring the perils of the trip from Alaska many are lost, either by missing the islands altogether or by being caught in storms; or by reason of insufficient strength and wing power. The flight from the islands to Alaska, though not without danger, is less hazardous than the southern flight, both because a much greater proportion of the migrants are mature and experienced, and because, in case they lose their way, they have two continents as marks to hit.

¹ I have several specimens taken in March and April which were kindly sent me by my friends Mr. Henry Patten and Mr. W. B. Newell of Hilo. These are in spring plumage but show unmistakable signs of molting.

The motive for the fall migration of the plover, like that of the other waders breeding in the far north, is easily understood. Whatever may have been the case in the distant past, to-day the waders have no alternative. They must migrate from the Arctic in the fall or starve. The only choice offered is as to the selection of winter quarters. Thus compelled to migrate, it appears that a certain number of plover and of several other shore-birds find the Hawaiian Islands a winter resort so attractive that to reach them they brave the perils of migration across a wide and stormy ocean. Why then do they not permanently colonize the islands? If adapted to the bird's needs for nine months of the year, why not for the other three?

It cannot be said of the spring migration of these Hawaiian migrants as of the fall, that the birds have no alternative. On the contrary the choice is open, and they would seem to have every incentive to remain, with no very apparent motive to migrate. The chief cause compelling winter visitors to the Tropics to leave and to seek northern regions in which to breed has been supposed to be the overcrowding of the Tropics in spring and the resulting lack of room and of food. No such conditions appear to confront the winter sojourners of Hawaii. During its stay in the islands the plover, as also the turnstone, feed chiefly in the upland pastures and clearings, up to 6000 or 7000 feet, and on newly plowed cane land. Both the sugar planter and the stock raiser have much to thank the plover for, since, while the birds feed on small seeds to some extent, they live chiefly on insects, and according to Perkins, on insects of much economic importance, since they depend largely on the caterpillars of two of the most widely spread and destructive of the island 'cut worms.' These insects are most abundant when the grass on the island pastures is green and luxuriant, and this usually is in winter when rains are most copious. That the supply of food in winter and spring is ample is sufficiently attested by the fact that the birds get into such excellent condition. Even if it be assumed that the supply of food in summer is less than in spring, and hence inadequate for the needs of the thousands that winter here, together with their young, still there is enough to sustain very many more than the comparatively small number of non-breeders that summer here.

From the standpoint of the food supply it is even more difficult to explain why the tattler and the curlew leave the islands in spring, since these birds feed almost wholly along shore where there can be no appreciable difference in the quantity of food summer and winter.

The question why the island plover migrate is all the more difficult to answer when we remember that the islands have been permanently colonized by certain other American birds, such as the Hawaiian Stilt among the Limicolæ, the Night Heron of the Herodiones, the Hawaiian Mud Hen and Gallinule of the Paludicolæ, the Hawaiian Goose, the Short-eared Owl, and the island Buteo. These birds came to the islands as waifs, as did the plover. Finding room, shelter, and food abundant, they wisely elected to roam no more, but to become permanent residents, and to forswear for all time the perilous and unnecessary habit of migration. Since *they* successfully resisted the impulse to return to their former summer homes to nest, then why not the other species? As stated above the failure of the plover and turnstone to become permanent colonists is not because they are crowded out by other species. In fall the migrants from Alaska find the inviting island pastures unoccupied, and as they find them in fall, so they leave them in spring.

I can suggest no very convincing answer to the question, but I may note the significant fact that the present suitability of the islands as a breeding ground for the plover and turnstones is very recent as compared with the birds' acquaintance with them. The cleared strip around each island now planted chiefly to cane, which may be roughly stated to be three miles wide, and the extensive clearings above this strip which serve for pasture for cattle, are less than a hundred years old, most of them less than 50. Prior to their discovery by Europeans all the islands were heavily forested, nearly or quite to the shore. Possibly then the plover and other migrants have been slower to realize the situation than the other species, and do not even yet appreciate the advantages offered by continuous island life.

It may be said too that the spring migration of the plover and turnstone is so intimately interwoven with the function of reproduction, that we are quite safe in assuming that, were it not for the desire to nest, the birds would never migrate. Those in fact which

are not stirred by the impulse to nest, either because too immature or too old, do not migrate; and the intimate connection between migration and reproduction appears further from the fact that all the individuals that migrate don the nuptial dress before they start, a sufficient declaration of their purpose in undertaking the trip; while those that remain retain the dull winter plumage.

It appears to be true of all birds that having once reached their winter quarters, be they near or far from the summer home, no migrating species attempts to return to its summer haunts till stimulated thereto by the profound physiological change consequent upon reproductive activity. This impulse is not primarily due to change of season or to change of temperature, but is periodic and physiological. When once felt, every instinct seems to impel birds to take the shortest route to the spot where they first saw the light, or where they have reared young. This has often been called the home instinct. In the case of many species the phrase is not very happily chosen, though I myself have used it, since that locality is more properly to be called a bird's home where it spends the greater part of its life, rather than where it spends a few brief weeks annually. Nevertheless the power of habit transmitted through thousands of years is very great, and it is probably this influence associated with the reproductive instinct which so far has prevailed over other considerations and caused the plover to migrate from Hawaii in spring.

If the Charadriid birds, the plovers, sandpipers, and curlews, originated in the Arctic, as Seebohm and others believe, and were forced by the exigencies of the ice age to become wanderers over the face of the earth, then indeed the spring migration of the waders from their distant winter resorts is more fitly termed a return home, and the instinct prompting the flight the homing instinct. Originally forced by the ice invasion to abandon their then Arctic Paradise and seek shelter and food in distant parts, as the ice receded they gradually formed fly lines to and from their summer and winter homes till the habit formed during thousands of years became so fixed as to absolutely dominate many species. That it did not dominate all of the original migrants, however, appears from the fact that permanent colonies settled here and there even in tropical regions, showing that under certain circumstances the

habit of migration can be and is overcome. Of the island plover all we can say is that so far as we can see its spring migration to its Arctic breeding grounds is not necessary, except in so far as made so by the tyranny of habit.

This explanation has at least the advantage that it explains nothing, and hence leaves the problem open. It simply shifts slightly the point of view. We perceive that the island attractions have proved sufficiently strong to make permanent residents of certain species which have strayed to the archipelago. In the case of other strays, like the island plover and the turnstone, either the island attractions are not so strong, or the birds' love for their original habitat is stronger, and they continue to migrate, though with much danger and at a great cost in lives.

Before leaving this subject I must add that several independent observers have reported finding a few young plover and turnstones in summer on the coast of Kau, island of Hawaii, and at one time I thought it possible that a few curlews also remained to breed; but in the case of none of these species was I able to fully satisfy myself that the birds reported were nestlings. It is, however, not impossible that occasionally a disabled female plover, tattler, turnstone or curlew secures a mate and nests in Hawaii. Indeed it seems highly probable that it is in this accidental sort of way that new avian colonies are occasionally planted. Such indeed may be the explanation of the resident colonies of American species like the coot, gallinule and others above referred to. Possibly, too, young birds of the year remaining for the summer occasionally feel the breeding impulse after their comrades have left for the north and so breed and found permanent colonies.

NOTES ON THE AUTUMN MIGRATION OF THE CANADA GOOSE IN EASTERN MASSACHUSETTS.

BY J. C. PHILLIPS.

THE Canada goose presents a comparatively easy mark for migratory study, and the notes which follow are based on data from the following sources:

First. Ten years continuous observations at a stand on Wenham Lake from about September 20 to about November 20, some years well into December.

Second. Five years continuous observation at Oldham Pond, Pembroke, from before October 1 to December 23-27.

Third. Record of first geese shot and totals of stand at the Island Oldham, 1876 to 1897. Scores at Baker's camp, Oldham, 1896 to 1904.

Fourth. Goose killings at a large number of gunning camps from all along the flight-belt. It may be here stated that these totals can be accepted as accurate, because, there being intense rivalry among the stands, the result of almost every shot is seen or heard among the neighbors, thus rendering exaggeration nearly impossible.

Daily Records.—The method of recording data at Wenham and Oldham Camps has been as follows:

At the end of each day the weather is briefly recorded, with the number and species of all fowl seen flying, and of all which lit in pond, together with those shot and details of shooting. Watch is supposed to be continuous, but is necessarily interrupted for meals, camp work, etc. Watch is usually kept on moonlight nights during flight-time for at least the first part of the night.

Scope of Notes.—In the notes that follow, I have attempted to gain a more accurate idea of the time, direction, volume and width of the autumn coastal flight.

General.—I have had a chance to study the geese in August, in James Bay, where the young families were beginning to arrive on the great marshes from the inland muskegs and ponds; and the flocks were mainly composed of separate families of from five to eight birds.

Currituck, N. C., has been visited nearly every winter for the past eleven years, and close observation and inquiry has led me to believe that geese are slightly on the increase in that sound. This may be due to a partial shifting of more westerly flights owing to changed conditions of the country, to an increase in the Atlantic Coast flight, or to a complex of conditions of which we are ignorant.

The score in geese at one club at Currituck, for the past season, was over one thousand; though this is an especially favorable place. At this same club 5795 geese have been taken in the last 22 years. 1909-10 is the largest year, corresponding with largest flight at Oldham Pond. It does not seem possible that geese can be even holding their own, though old goose gunners in Massachusetts see no decrease.

Arrival in Massachusetts.—Turning to Massachusetts, I find my earliest date for arrival is at Wenham, September 28, 1900. Earlier flocks have been noted, but I am not entirely satisfied that they were not cormorant, so I shall not consider them. In 1904 there is a date for killing on October 1 at Wenham. From 1900 to 1909, the average appearance at Wenham is October 16. The latest appearance is November 16.

The past five years at Oldham Pond, Pembroke, show earliest October 15, latest October 22, average October 19. Dates of first killing at the old Island camp, 1876-97, are earliest October 11, latest November 8, average October 23. I note that the ten year average at Wenham is earlier than any other average, which is curious, because fewer geese occur there. Since then I have found an earlier date, October 2, 1891, for Oldham — 6 out of 7 geese shot.

Perusal of my Oldham books shows in a general way an October flight from the 15th to 27th, which is followed by an entire blank. The November flight begins from November 5 to 19, the dates for the five years being November 8, November 5, November 19, November 8, November 5. Thus there is an interval during which no geese are seen. It averages seventeen days, or 12, 11, 27, 23 and 15 days respectively.

The birds in the early flight are apt to be low and to decoy well. No great flights are noted, and I should doubt whether they ever occur.

The November flight lasts for a long time, interrupted by periods

of a week or more during which no geese are heard of from any points. It lasts up until Christmas time, or a little before, the bulk having passed by December 1. It is apparently always followed by a small migration during the first week in January. Geese have often been reported to me at Ipswich during this time, and at Accord, Mass. The latest date which I have recorded is January 11, 1907, though I dare say there are much later ones. In early January, 1909, there was a good flight at Accord; as many as four or five bunches being seen in one day.

I have a letter from Mr. T. C. Wilson of Ipswich in which he says, "I gunned all day in a flight of geese, January 3, 1905 or 1906, — I can't recollect which date, but there were plenty of them. I killed four. In 1908 I killed one out of three on January 5, but they had been hanging around for some time."

It should here be stated that there are only very rarely any "tending" geese in the belt of migration which we are considering. Farther out on the Cape and on Martha's Vineyard a few spend the whole winter, especially if it be mild. Wood's in the 'New England Prospects,' 1634, says in regard to Geese: "These come in great flocks about Michelmasse, sometimes there will be two or three thousand in a flock: these continue six weeks and so fly to the southward, returning in March and staying six weeks more." This state of affairs, however, has passed long ago.

I have no systematic records for the spring flight, and will dismiss this subject by simply saying that it occurs in Massachusetts, well to the east of the fall flight belt, and that the birds have a tendency to tarry on the outer Cape and Vineyard.

Total Bags for Eastern Massachusetts.—To get an idea of the entire toll taken from the ranks of the geese in Eastern Massachusetts during the fall, I gathered a number of records from the stands in 1908, and allowing for those I did not know about, arrived at the figure 1450.

For the past season, with more extended data and a better goose year, I reached the figure 1900.

These figures in detail for 1908 are as follows:

Oldham Pond, Pembroke.....96	Monponsett Pond, Halifax.....70
Pleasant Lake, Harwich.....9	Furnace Pond, Pembroke.....8
Accord Pond, So. Hingham....120	Indian Head.....2
Bog near Accord.....30	Wenham Lake.....14
Jacob's Pond, Norwell.....25	Punkapoag Pond.....about 120
Duxbury Bay.....350	Chebacco Pond, Essex.....46
Silver Lake, Kingston.....325	Clarke's Pond, Ipswich...about 40
Great South Pond, Plymouth..125	Martha's Vineyard.....about 25
Weymouth Pond.....160	All others.....about 150
Whitman Pond, Weymouth...85	Total.....1900
Robbins Pond, E. Bridgwater..100	

Map of Flight.— Various records for Essex County have showed that the western edge of the flight crosses Cape Ann near Essex, and that at Wenham we are just outside of it. For four years during which late records were kept at Wenham, an average of only 143 geese a year were seen, about 12% as many as the Oldham average. At Chebacco Lake, four miles east, many more are seen and taken each year,— therefore, we are here in the neighborhood of the western edge of the flight belt. Chebacco Pond records for the past six years have been examined with this point in view.

South of Boston, we find Punkapoag and Quincy Bay inside the belt. Passing east, we cross the flight-belt, which is about 36 miles broad and has its eastern edge roughly at Manomet Point, Plymouth, or the eastern coast of Buzzards Bay. I cannot find that such great flights as are witnessed at Duxbury Bay and Mattapoisett occur much further east. The ponds southeast of Plymouth, such as Long Pond, Halfway Pond, White Island Pond, and Billington's sea were never famous as good ponds.

As we go out on the Cape, we find the flight more and more scattering and irregular. At Pleasant Lake, Harwich, as many as 60 have been shot in the fall, and sometimes scarcely any at all,— last year 9. The same conditions hold at Cliff Pond, Brewster, Eastham Pond, and Gull Pond, Wellfleet. All these places occasionally get geese, but there is no dependable flight. It is the same with the Vineyard. I am told on good authority, from two different sources, that the fall bag for that island will not average much over 25 birds.

Direction of Flight.— It is interesting to try and get at the direction of this overland flight. So many times flocks going over

Hanover Four Corners, and identified there by count, have come straight over Oldham Camp, that I take this as a common direction line.

If we join these points we get a direction 20° east of true north. Now if we draw out this same course south of Essex, we find it touches Punkapoag Pond, as I think it should. Placing a parallel line to this through Manomet Point, we include a belt 36 miles wide which is strikingly parallel to the coast between Portland and Boston, and some distance off shore.

South of Massachusetts the flight must bend east. A considerable flight noted at Wenham and Oldham November 13, 1909, was recorded on the same date at Montauk Point, Long Island, as a "constant stream of geese." The general direction of large numbers of geese passing over us at Oldham has been noted. I should say that this was seldom over 35 degrees east of north. Of course, in heavy westerlies the birds must have to head into the wind to allow for drift.

Lines of Flight.—It is difficult to say whether inside our belt there is any preference for certain lines. It is a noteworthy fact that a flight lasting a day or more is very apt to follow a certain line. On November 18, 1908, I note,—“For last four days good flight at Accord Pond. Score for Pond 89 geese, none seen at other ponds.” This sort of thing happens all the time. It is also a common observation, especially when a flight is on, to see one bunch following up another, and in sight of it. Often several bunches have come into the pond inside of five minutes. Valley routes seem to be preferred. At Wenham we have a striking example of this.

Birds are seen when they are looked for, and we know that at the following places considerable flights are seen every season: Weymouth Great Pond, Whitman's, Accord, Oldham, Silver Lake, Duxbury Bay, and Great South Pond. It will be noted that the best goose ponds are those lying within the flight-belt and nearest Massachusetts Bay. In reply to a letter asking about the size of goose flights at Duxbury, Dr. Rockwell Coffin writes me as follows:

“I should say I have, at times, seen between 2000 to 3000 geese in a day, many of them outside of the sand bar, and so far away that it is impossible to tell them from brant unless one uses a strong

glass. Besides these, during a flight we have a good many going over the island at night, which we can hear but not see. Last year, 1908, in the big flight, I have heard it said that at least 10,000 geese passed in one day, but probably this is an exaggeration."

Of course, it is probable that such large and attractive sheets of water as Duxbury Bay concentrate a migratory wave, even if few birds are stopping, and the same may be true with the larger ponds to a lesser extent. However, there are no extensive observations that I can find on points away from the ponds.

Calculations for Number.—Now as to the Oldham records on the point of numbers. I have the totals and averages for the past five years of all geese seen from this point. Flocks that are unestimated, of which there is an average of five each year, I place at 35, this being the average size of a migrating flock, as taken from a list of about 40 bunches which were carefully counted. Many of these unestimated bunches were large ones, so we are on the safe side.

The smallest year was 1906 — 458 and 9 bunches.

The largest year was 1909 — 1649 and 4 bunches.

The total average of geese per year is 1145.

To this I think it fair to add 50% more for all those passing unobserved in the night, for those which escape observation in the day time, and for the January flight. We then get a total yearly average of 1717. Now the arc of sky under observation at Oldham is comparatively narrow. Geese east of us can only be seen a very short distance on account of flat land and high timber, and west of us across the pond the land is fairly high. I assume this arc to be about $1\frac{1}{2}$ miles wide. Some high geese would be visible outside of the limits thus set, while I think low geese near either edge might not be seen at all. The estimate of the width of this arc is of course open to serious error, but it is the best that can be done for the present. If then we divide the whole flight belt of 36 miles into 20 belts, each of $1\frac{1}{2}$ miles, we get a yearly total of 34,340. Outside of our 36 mile belt, it is useless to speculate, but it seems probable that by far the largest proportion of the Atlantic coastal flight is included between our parallels.

I know very little about the height that geese may travel at. It is possible that many flocks may escape observation from their

height alone. The gunner usually depends on his decoy geese to show him high flying fowl.

The above estimates are, of course, only of comparative value, and must not be taken too literally.

Weather.—Every one who has gunned for migratory geese knows in a general way that calm weather or brisk southwesterly winds are better times to decoy birds than during northerly to northwesterly winds. Geese will almost never stop in brisk northwesterlies, though heavy flights occur on these winds. The gunner does not expect and only rarely does he see geese during easterly weather. Probably geese never start a migration with winds directly behind them, or with a low pressure area about them, but occasionally they run into a sudden local disturbance.

In an attempt to find out something more on this subject, I studied the United States Weather Charts corresponding to the dates of 12 big flights. I took only my own records for these dates. The weather charts run up to Father Point, Quebec, and include observation in Newfoundland. It would take a lot of work and careful study of the Canadian records to enable one to make definite statements. Speaking very generally in regard to the whole Northeast Coast, the most noteworthy feature of the weather on the dates of the flights seems to be absence of wind, or winds light N. W. to N., and lack of low pressure areas, though these may just have passed northeastwards over the Gulf of St. Lawrence.

An attempt was made to group flights into two classes,—Favorable and Unfavorable,—placing in the first class those high flights that paid no attention to decoys or ponds, and in the second class, periods when geese flew low and decoyed well. The data available are not sufficient, but seem to point to the fact that geese feel more like stopping after a long flight through calm warm air than during moderate to brisk north to northwest weather, even if it be complicated by cloud and precipitation.

Habits.—I cannot close without saying a word about the curious fact of migrating geese entirely losing their heads when a good shot is made among them. At such a time the same geese that would spring at the slightest notion of danger, will often allow themselves to be shot from a boat. I have once or twice seen wild geese sit on the beach after a shot has been fired. This must be

due either to a very strong interdependence of the flock, or to utter stupidity, and we can scarcely credit it entirely to the latter. Although geese are so very shy at home, they will at times light in the most astonishing places. At Wenham, geese have lit in a flooded orchard in the spring in answer to a few honks from captive geese, and wild geese were twice caught in my breeding pens on a small brook. They do not appear to pay any attention to buildings or artificial stationary objects if they once make up their minds to come to decoys, and in this way are wholly unlike their smaller cousins, the ducks.

In confinement geese are interesting pets and just fail to attain the state of complete domestication. Under the ordinary conditions of confinement, only a certain proportion mate and breed, many remaining celibates to a green old age.

Variation.—In regard to variation in the wild state, we notice a great range in size, and a considerable difference in the whiteness of the breast feathers. This last is not a difference due to age, as old geese kept by me are almost perfectly gray underneath, others close to pure white.

A gander of one of my mated pairs showed a very distinct ruddy tinge to the tips of the feathers of the upper back and sides, and this peculiarity was passed on to his young, though to a lesser degree. I have seen this variation several times in wild birds.

One hears a great deal of talk among gunners in Massachusetts about the late flight of white-bellied geese. These are supposed to be shorter necked and whiter on the breast. I have seen flocks consisting of probably a single family which were certainly white and full feathered, but I imagine these are birds which hatched and moulted early. It may be that a pair of birds showing less pigment than the average will have young like themselves.

Mr. J. W. Whealton of Chincoteague, Va., who has raised a great many Canadian geese on that island, has been reported by Mr. Beebe as believing in a distinct northern and southern race of geese, though no definite reasons for this statement are given. The northern race is supposed to be larger.

It is hoped to continue observations at Oldham Pond for the next five years which, when compared with or added to the present records may be of some interest and significance.

Brant.—At Oldham Pond the records for five years show the occurrence of Brant only four times. 1905 — 1 in pond, flock of 30 flying. 1907 — 1 in pond. 1909 — flock of 18 in pond. This shows clearly the preference of the Brant for the longer and more easterly route outside Cape Cod.

SUMMER AND FALL BIRDS OF THE HAMLIN LAKE REGION, MASON COUNTY, MICH.

BY RALPH WORKS CHANEY.

THE records upon which the following list of birds is based were taken in the Hamlin Lake Region, in Western Mason County, Michigan, during a period extending from June 20 to September 27, 1909.

The main portion of Hamlin Lake is some seven miles long and opens into Lake Michigan on the west through a channel less than a mile in length. Entering Big Hamlin from the northeast is Upper Hamlin Lake, which is less than half as long as the larger lake, and only half a mile across at its widest point. Into Upper Hamlin from the east flows the Sable River, at the mouth of which are large marshes, which I did not explore. Many small streams, usually heavily wooded, flow into Upper Hamlin, widening at their mouths into swampy "bayous" bristling with tall stumps and snags. Woods rise up on all sides of the lake, especially on the north, in which direction they extend for many miles. Formerly a lumbering country, this region now contains but few white pines, most of the timber being hardwood, beech, maple, oak and birch. Hemlock also is commonly scattered through the beech woods, and along the creeks arbor vitæ is the most abundant form. Parallel with Lake Michigan, numerous sand ridges extend toward the north, the tops of which are covered with oak and hemlock. The little valleys between these ridges are almost jungles, from their profusion of saplings, ferns, blackberry bushes, and other under-

brush. Near Lake Michigan are extensive dunes, bare except for a covering of wild grape-vines and a few scattered trees. A mile back in the woods from Upper Hamlin lies Nordhouse Lake, which shrinks to a small pond by the end of the summer, but furnishes a good feeding place for ducks and shore birds. On the east and to some extent on the south of Upper Hamlin are extensive farms and orchards, about which many common birds were seen.

This region appears to be the southern breeding limit of a number of the more northern species. In Oceana County, near Little Point Sable, less than thirty miles south, such birds as the Yellow-bellied Sapsucker, Junco and Winter Wren are not commonly seen during the summer. These species and other northern breeding birds were seen about Hamlin Lake all summer, though not in large numbers.

Several short trips were taken into Oceana County, in the vicinity of Silver Lake, where I saw a number of ducks and shorebirds not observed in Mason County.

1. **Colymbus auritus.** HORNE GREBE.— This species was not observed during the summer, and was seen only once on Upper Hamlin, Sept. 16. A specimen was taken at Silver Lake, in Oceana Co., on Sept. 23.

2. **Podilymbus podiceps.** PIED-BILLED GREBE.— During the latter part of the summer this grebe could be seen daily in small flocks on Nordhouse Lake.

3. **Gavia immer.** LOON.— One was seen Sept. 21 on Lake Michigan.

4. **Larus argentatus.** HERRING GULL.— Although common around the harbor at Ludington during the summer, I saw no evidence of breeding. Migrants from the north came down early in September.

5. **Larus delawarensis.** RING-BILLED GULL.— Common along Lake Michigan during September.

6. **Larus philadelphia.** BONAPARTE'S GULL.— Large flocks were seen on Upper Hamlin early in September.

7. **Lophodytes cucullatus.** HOODED MERGANSER.— An immature female was secured from a flock of three, all in immature plumage, at Nordhouse Lake on Sept. 11.

8. **Anas platyrhynchos.** MALLARD.— Several females were seen at Silver Lake on Sept. 23.

9. **Anas rubripes.** BLACK DUCK.— While hunting on Silver Lake on Sept. 23, I secured two females from a flock of about ten. When alarmed the birds rose in almost perpendicular spirals which soon carried them out of range.

10. **Querquedula discors.** BLUE-WINGED TEAL.— Fairly common. A specimen was taken at Silver Lake on Sept. 23.

11. *Marila americana*. REDHEAD.—A flock of four Redheads was seen on Upper Hamlin on Sept. 26.
12. *Marila affinis*. LESSER SCAUP DUCK.—Several pairs were breeding in the "bayous" on the north side of Upper Hamlin. On July 1 I saw a flock of young birds barely able to fly.
13. *Botaurus lentiginosus*. AMERICAN BITTERN.—Common in swampy territory, but seldom seen about Hamlin Lake.
14. *Ardea herodias*. GREAT BLUE HERON.—Single birds could be seen almost daily flying over the lake to a rookery on the Pere Marquette River. Toward evening it was a common sight to see them fishing along the marshy shores.
15. *Fulica americana*. COOT.—Rather common late in September.
16. *Pisobia minutilla*. LEAST SANDPIPER.—Common, in small flocks along the shore of Lake Michigan during September.
17. *Calidris leucophæa*. SANDERLING.—Large flocks were seen near Lake Michigan in September.
18. *Totanus melanoleucus*. GREATER YELLOW-LEGS.—A single bird was seen flying over Upper Hamlin on Aug. 17.
19. *Totanus flavipes*. YELLOW-LEGS.—Common about Nordhouse Lake during the latter part of August and early September.
20. *Helodromas solitarius*. SOLITARY SANDPIPER.—Common about the lakes after Sept. 9.
21. *Actitis macularia*. SPOTTED SANDPIPER.—This species bred abundantly around Upper Hamlin. Young birds were seen on June 27.
22. *Charadrius dominicus*. GOLDEN PLOVER.—A dead specimen was picked up on the shore of Silver Lake on Sept. 23.
23. *Oxyechus vociferus*. KILLDEER PLOVER.—Rather common. Flocks were seen frequently during September.
24. *Ægialitis semipalmata*. SEMIPALMATED PLOVER.—Large flocks were seen at Silver Lake on Sept. 23.
25. *Colinus virginianus*. BOB-WHITE.—Common in the farming regions, and about open hills. Young were observed on June 28.
26. *Bonasa umbellus*. RUFFED GROUSE.—This species was most common in the dense coniferous woods, and along the heavily wooded creeks. A female with young was seen on June 30.
27. *Zenaida macroura carolinensis*. MOURNING DOVE.—Not common, only a few pairs breeding in the open woods.
28. *Cathartes aura septentrionalis*. TURKEY VULTURE.—A pair was seen soaring over Hamlin Lake on July 16. Although regularly seen further south, I am told that this species is seldom observed at this latitude.
29. *Circus hudsonius*. MARSH HAWK.—Individuals were occasionally observed.
30. *Accipiter velox*. SHARP-SHINNED HAWK.—Not common. Occasionally seen about the "bayous".
31. *Buteo borealis*. RED-TAILED HAWK.—A pair of these birds was seen on Sept. 16.

32. *Haliaeetus leucocephalus*. BALD EAGLE.— Only one pair was seen about the lakes. Dr. Alfred Lewy of Chicago found an eagle's nest several years ago in the woods on the sand hills. It was placed about sixty feet from the ground in an oak, and on July 1 contained two large young.

33. *Falco sparverius*. SPARROW HAWK.— Fairly common on the wooded ridges.

34. *Otus asio*. SCREECH OWL.— On the chilly evenings and early dawns of September, the quavering call of this owl was heard frequently.

35. *Coccyzus americanus*. YELLOW-BILLED CUCKOO. Fairly common.

36. *Ceryle alcyon*. KINGFISHER.— Every suitable bank around the lakes was in possession of a pair of these noisy birds. Young birds were out in the last week in June.

37. *Dryobates villosus*. HAIRY WOODPECKER.— Common in the dense woods. In September they became quite abundant, and seemed to prefer the open or burnt-over woods.

38. *Dryobates pubescens medianus*. DOWNY WOODPECKER.— Common, especially during September.

39. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER.— A pair seen on July 12 on a burned over hillside was probably breeding, although I failed to locate the nest. Migrating birds were seen during the latter half of September.

40. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.— A few pairs were observed about the farms and clearings.

41. *Colaptes auratus luteus*. FLICKER.— Very common, nesting around clearings and in stumps in open fields. Nests contained young early in July. The farmers complained that the "Yellowhammers" did a great deal of damage to their corn crops.

42. *Antrostomus vociferus*. WHIP-POOR-WILL.— At dusk and early dawn these noisy fellows kept up a great racket around the edge of Upper Hamlin. Birds were occasionally flushed during the daytime in the hardwood forests.

43. *Chordeiles virginianus*. NIGHTHAWK.— Abundant over the lake and woods in the late afternoon and evening. On July 2, while crossing a burned-over ridge, I flushed a Nighthawk from a set of incubated eggs which were placed on the bare ground near a partly burned log. Migration in large flocks occurred between August 23 and Sept. 9.

44. *Chætura pelagica*. CHIMNEY SWIFT.— Very abundant in the towns but only a few pairs were observed about Upper Hamlin. A nest containing five eggs far advanced in incubation was discovered on July 11, on a wall in a stable of an unoccupied lumber camp in the midst of the woods.

45. *Archilochus colubris*. RUBY-THROATED HUMMINGBIRD.— Fairly common in the few suitable localities.

46. *Tyrannus tyrannus*. KINGBIRD.— This species might be considered almost aquatic in its nesting habits, as the nests were invariably placed in stumps projecting out of the water, often at a considerable distance from the shore. Nests with eggs — always three in number — were seen up to the middle of July.

47. *Myiarchus crinitus*. CRESTED FLYCATCHER.— A few pairs occupied the open portions of the woods. Young birds were out by July 19.
48. *Sayornis phoebe*. PHEBE.— Common about the farms.
49. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.— If classification were based on temperament, this species should be of the genus *Tyrannus*. Perched on the dead top of a hemlock, the male successfully guarded the vicinity of his nest in true Kingbird fashion, and his loud *whip-wheu-wheu-u-u* could be heard for a long distance. Several pairs were seen, invariably on wooded hillsides.
50. *Myiochanes virens*. WOOD PEWEE.— The most abundant bird of the hardwood timber. Young were flying by July 25.
51. *Empidonax flaviventris*. YELLOW-BELLIED FLYCATCHER.— One, probably migrating, was seen on August 25.
52. *Empidonax minimus*. LEAST FLYCATCHER.— Common, especially in the maple woods around the edge of Upper Hamlin. A nest was found on July 29 which contained two incubated eggs. This was placed in a semi-pensile position in a small fork in the outer branches of a maple, and would have passed for a nest of the Red-eyed Vireo.
53. *Cyanocitta cristata*. BLUE JAY.— Only occasionally seen during the summer, but became common in small flocks during the latter part of August.
54. *Corvus brachyrhynchos*. CROW.— Common around the lake and about the sandhills.
55. *Dolichonyx oryzivorus*. BOBOLINK.— Fairly common in the farming regions.
56. *Molothrus ater*. COWBIRD.— Not very commonly seen, although a number of eggs, usually in the nests of the Red-eyed Vireo, were found.
57. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD.— Common in the "bayous" and other marshy places.
58. *Sturnella magna*. MEADOWLARK.— A common bird about the farms.
59. *Icterus galbula*. BALTIMORE ORIOLE.— Not common around the lake. Young birds just out of their nest were seen on July 28.
60. *Euphagus carolinus*. RUSTY BLACKBIRD.— A small flock of migrating birds was seen on Sept. 24.
61. *Quiscalus quiscula seneus*. BRONZED GRACKLE.— A few pairs were breeding in the hemlocks around the edge of Upper Hamlin.
62. *Astragalinus tristis*. GOLDFINCH.— Abundant.
63. *Plectrophenax nivalis*. SNOW BUNTING.— A single bird was seen feeding along the shore of Nordhouse Lake on Sept. 25.
64. *Poœcetes gramineus*. VESPER SPARROW.— Common, especially about cultivated fields and clearings. A nest containing young was seen on July 3. In the latter part of September large flocks were noted daily.
65. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.— A singing bird observed on July 14 was probably breeding although I could not discover the nest. Migrants became common in the latter part of September.

66. *Spizella passerina*. CHIPPING SPARROW.— Abundant everywhere. Young in the nests were seen on Sept. 27, and fresh eggs as late as July 14. A nest was found on a horizontal branch of an oak far out in the woods, but the usual nesting site was about the clearings. Large flocks of migrants passed through during the first two weeks of September.

67. *Spizella pusilla*. FIELD SPARROW.— Not common.

68. *Junco hyemalis*. SLATE-COLORED JUNCO.— Only one pair was observed during the summer. Migrating birds became common the last week of September.

69. *Melospiza melodia*. SONG SPARROW.— Abundant. A nest with young was seen on June 25.

70. *Melospiza georgiana*. SWAMP SPARROW.— Rather common on the edges of the "bayous."

71. *Passerella iliaca*. FOX SPARROW.— The only Fox Sparrow seen was one which alighted on the steamer at the middle of Lake Michigan on Sept. 27. Other land birds seen at mid-lake were Flickers, a Palm Warbler, and several Golden-crowned Kinglets, the latter of which allowed me to pick them up without any fear.

72. *Pipilo erythrophthalmus*. TOWHEE.— Very abundant about the edge of the woods and in the brushy clearings. A nest found was on the ground near a road, and contained young early in July. Large flocks of migrating birds, largely immature, were seen during September.

73. *Zamelodia ludoviciana*. ROSE-BREADED GROSBEAK.— Fairly common on the wooded sides.

74. *Passerina cyanea*. INDIGO BUNTING.— Only a few pairs were seen.

75. *Piranga erythromelas*. SCARLET TANAGER.— The song of the Tanager could almost always be heard in the beech forests. A nest in the outer branches of a hemlock contained newly hatched young on June 21.

76. *Progne subis*. PURPLE MARTIN.— Abundant in town, but not seen about the lakes.

77. *Petrochelidon lunifrons*. CLIFF SWALLOW.— This species was seen migrating with other swallows during a heavy gale on August 31.

78. *Hirundo erythrogastra*. BARN SWALLOW.— Only occasionally seen about Upper Hamlin. Nests in boathouses were still occupied on July 31.

79. *Iridoprocne bicolor*. TREE SWALLOW.— Large colonies of these swallows nested in cavities of dead stumps which projected out of the lake. Nests contained young on June 26.

80. *Riparia riparia*. BANK SWALLOW.— Common, especially during the evening when large flocks darted over the water. Nests of a small colony in the sandbank contained large young July 5.

81. *Bombycilla cedrorum*. CEDAR WAXWING.— Very common everywhere, especially on the hill-sides. Large flocks were common after the last of August.

82. *Vireosylva olivacea*. RED-EYED VIREO.— This was the most abundant songster of the woods. Several nests were found, all in the lower

branches of oaks on the hill-sides about the lake. Fresh eggs were seen on June 22, and young were in their nests as late as the middle of July. Small migrating flocks passed through about Sept. 1.

83. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Fairly common in the heavy timber. Young were seen on July 16. During the last week of August flocks of migrants became very common, and a few stragglers were seen as late as Sept. 20.

84. *Dendroica aestiva*. YELLOW WARBLER.—Only occasionally seen.

85. *Dendroica caerulescens*. BLACK-THROATED BLUE WARBLER.—Not seen during the summer. Small migrating flocks were seen from August 26 to Sept. 17.

86. *Dendroica coronata*. MYRTLE WARBLER.—Migrants were first seen on Sept. 24.

87. *Dendroica magnolia*. MAGNOLIA WARBLER.—A rather uncommon migrant during the last week of August.

88. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—Common about the open woods and bushy hill-sides. Young were out on July 19. During the last week of August large migrating flocks were seen.

89. *Dendroica castanea*. BAY-BREASTED WARBLER.—A specimen was taken on August 28.

90. *Dendroica striata*. BLACK-POLL WARBLER.—An abundant migrant from August 29 to the middle of September.

91. *Dendroica blackburniae*. BLACKBURNIAN WARBLER.—A fairly common migrant during the latter part of August.

92. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—The beautiful song of this warbler could be heard at all times in the pine woods. It was not only the most common member of its family during the summer, but was also the most abundant in the migration, which occurred throughout the month of September.

93. *Dendroica vigorsi*. PINE WARBLER.—This well-named bird was rather common among the scattered pines on the hill-sides. On July 12, I discovered a nest in the top of a Norway pine, containing four young which left it a few days later. A migrating flock was seen on Sept. 11.

94. *Dendroica palmarum*. PALM WARBLER.—The first migrants were seen on Sept. 11, after which large flocks were seen daily.

95. *Seiurus aurocapillus*. OVENBIRD.—Very common, nesting on the road sides. Last seen on Sept. 11.

96. *Seiurus noveboracensis notabilis*. GRINNELL'S WATER THRUSH.—Probably a summer resident. A migrant taken on August 29, was determined to be of this subspecies.

97. *Oporornis agilis*. CONNECTICUT WARBLER.—Fairly common migrant, specimens being secured August 30 and Sept. 14.

98. *Oporornis philadelphia*. MOURNING WARBLER.—A migrating bird was taken on August 24.

99. *Geothlypis trichas*. MARYLAND YELLOW-THROAT.—Found in the low marshy woods and thickets.

100. *Wilsonia pusilla*. WILSON'S WARBLER.—Small migrating flocks were seen on August 30.

101. *Wilsonia canadensis*. CANADIAN WARBLER.—This species was rather common in the small ravines where under-brush, ferns, and rotting logs made the way almost impassable. On July 11, I saw a male carrying food to its young, but was unable to discover the nest. Migrants were seen up to Sept. 17.

102. *Setophaga ruticilla*. REDSTART.—Common, especially around the shore of Upper Hamlin. A nest which the young had just left was seen on July, and another containing four newly hatched young was discovered on July 31. A common migrant in small flocks between August 29, and Sept. 18.

103. *Anthus rubescens*. PIPIT.—A specimen was taken Sept. 17, on the shore of Nordhouse Lake.

104. *Dumetella carolinensis*. CATBIRD.—Common in the shrubbery about the clearings. A nest containing fresh eggs was found on July 27, and another with young on July 16.

105. *Toxostoma rufum*. BROWN THRASHER.—Not very common. A nest containing three eggs was found on the ground in a hay field on July 2.

106. *Troglodytes aëdon*. HOUSE WREN.—This species nested abundantly, not only about the farms and cottages, but also in dead stumps in the marshes and far out in the woods. Young in the nest were seen as early as June 27, and fresh eggs as late as July 16.

107. *Nannus hiemalis*. WINTER WREN.—Several pairs were seen in the densest part of the woods, and usually near a stream.

108. *Telmatodytes palustris*. LONG-BILLED MARSH WREN.—Apparently not common, even in suitable localities.

109. *Certhia familiaris americana*. BROWN CREEPER.—Migrants arrived on Sept. 18.

110. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.—Common in the open woods during the summer, and becoming abundant in late August and September.

111. *Sitta canadensis*. RED-BREASTED NUTHATCH.—A common migrant after Sept. 18.

112. *Penthestes atricapillus*. CHICKADEE.—Very common, especially during September.

113. *Regulus satrapa*. GOLDEN-CROWNED KINGLET.—Migrating birds were seen on Sept. 23.

114. *Regulus calendula*. RUBY-CROWNED KINGLET.—A common migrant after Sept. 18.

115. *Hylocichla mustelina*. WOOD THRUSH.—Occasionally heard singing on summer evenings. Migrants were seen up to Sept. 18.

116. *Hylocichla ustulata swainsoni*. OLIVE-BACKED THRUSH.—A very common migrant after Sept. 14.

117. *Hylocichla guttata pallasi*. HERMIT THRUSH.—On the hottest

afternoons of August, as well as at all other times, the song of the Hermit could be heard from his perch in the dead top of a tall beach or hemlock. Migrants were seen up to the time I left.

118. *Planesticus migratorius*. ROBIN.—Abundant during the summer, and migrating in large flocks in the latter half of September.

119. *Sialia sialis*. BLUEBIRD.—Rather common in the burned over areas, where dead stumps give suitable breeding places. Large flocks were seen during September.

NOTES ON THE BIRDS OF PIMA COUNTY, ARIZONA.

BY STEPHEN SARGENT VISHER.

IN 'The Auk' for 1886-88, Mr. W. E. D. Scott published an account of the birds of Pinal, Pima, and Gila counties of south central Arizona. The list in the introduction to Bailey's 'Handbook of Birds of Western United States' is an abstract of Scott's. It mentions about 230 species as occurring in Pima County.

Mr. Herbert Brown, of Tucson, so frequently quoted by Scott, has, since 1888, published in 'The Auk' accounts of the occurrence of (1) Purple Gallinule ('88), (2) Scarlet Ibis ('99), (3) Water-turkey and Tree-duck (1906).

During the past dozen years Mr. Richard D. Lusk of Tucson has done much work, especially with the nesting birds of the mountains. The many records which he has been kind enough to permit me to announce are all based on the capture of specimens.

In August, 1907, and during the months March to September, 1909, I studied the valley in which Tucson lies, intensively, and, in 1909, the Santa Catalina mountain range extensively.

It is not impossible that the lapse of a quarter of a century has changed somewhat the avifauna of this changing region. At any rate a number of species (thirty) may be added to Scott's and Herbert Brown's lists; and the relative abundance, etc., of certain forms may with advantage be restated. However, the announcement of the occurrence of the several additional varieties is not so much the purpose of this article as the desire to add a mite to the

far too meagre knowledge of the habits and songs of many interesting birds.

The following list treats only those (127 species) about which I believe I can contribute something. Of the other hundred observed, Mr. Scott correctly gives their distribution, etc., and the Baileys and Chapman ('Color Key' and 'Camps and Cruises of an Ornithologist') have described their songs, etc., as well or better than I can.

A single asterisk follows twenty-one names and indicates that this species is here reported from an altitude quite different from that given by Scott. Many mountain forms were found migrating along the lowlands.

A double asterisk occurs twenty-eight times and indicates a new record for Pima County.

A triple asterisk marks nineteen species which were found nesting. Mr. Scott recorded them only as migrants or winter visitants.

The Red-eyed Cowbird and the White-headed Woodpecker are four times starred. The Hudsonian Godwit is also out of its prescribed range but unfortunately the record is not absolutely certain.

1. *Colymbus nigricollis californicus*. EARED GREBE.** — Rare Migrant. (Lusk.)
2. *Gavia immer*. LOON.** — Tolerably common migrant. (Lusk.)
Larus sp. Gull. — Occasionally a gull is seen migrating. (Lusk.)
3. *Hydrochelidon nigra surinamensis*. BLACK TERN.** — Common on the few ponds in August.
4. *Pelecanus erythrorhynchos*. WHITE PELICAN.** — Tolerably common migrant. (Lusk.)
5. *Ardea herodias treganzai*. SOUTH-WESTERN BLUE HERON. — Tolerably common summer resident.
6. *Grus mexicana*. SANDHILL CRANE.** — Common migrant. (Lusk.)
7. *Limosa hæmastica*. HUDSONIAN GODWIT.** — A Godwit, very probably of this species, was examined at close range, with binoculars, on a pond near Tucson, September 18. The fact that Scott questions the identification (Marbled) of the godwit he saw is suggestive.
8. *Totanus melanoleucus*. GREATER YELLOW-LEGS. — Rare migrant in spring as well as fall.
9. *Totanus flavipes*. YELLOW-LEGS.** — Tolerably common on a pond near Tucson early in September.
10. *Catoptrophorus semipalmatus inornatus*. WESTERN WILLET.** — Occasional migrant in May about Tucson. Taken by Mr. Herbert Brown.

11. *Charadrius dominicus*. GOLDEN PLOVER.** — Two seen at a pond in the valley August 16.
12. *Callipepla squamata*. SCALED QUAIL.* — A rare resident on the western as well as on the eastern slopes of the Catalina Mountains.
13. *Meleagris gallopavo merriami*. MERRIAM'S TURKEY. — Just about exterminated. A couple were killed in the Santa Catalinas in 1907 by hunters.
14. *Columba fasciata*. BAND-TAILED PIGEON. — Abundant in the mountains above 5000 feet, nesting mainly in the pine zone (7000 feet +) but descending to feed upon the fruit of the manzanita.
15. *Zenaidura macroura carolinensis*. MOURNING DOVE. — Exceedingly abundant in April and May. Flocks of several hundred were seen. Tolerably common in summer.
16. *Melopelia leucoptera*. WHITE-WINGED DOVE. — Abundant summer resident, arriving about April 7. Ranges up to 4000 feet altitude. About the pools in the cañons, flocks of hundreds will gather in midday. Local "nimrods" consider it great sport to slaughter them there.
17. *Chæmpelia passerina pallescens*. MEXICAN GROUND DOVE. — Abundant summer resident near Tucson. The short square tail and reddish tint of its wings in flight makes it very easy to distinguish from the grayish Inca.
18. *Scardafella inca*. INCA DOVE. — Common summer resident about Tucson.
19. *Urubitinga anthracina*. MEXICAN BLACK HAWK.** — An occasional breeder in the wilder parts of the mountains at 5000-7000 feet. The Zone-tailed Hawk and this are called "Mexican Eagles" by the hunters.
20. *Asturina plagiata*. MEXICAN GOSHAWK.* — One pair found breeding at 6000 feet in the oak zone.
21. *Falco columbarius*. PIGEON HAWK.* — Common in March and April near Tucson.
22. *Falco fusco-cœrulescens*. APLOMADO FALCON.** — A specimen of this beauty was taken by Mr. Lusk in the valley.
23. *Aluco pratincola*. BARN OWL.*** — An occasional resident. Nestlings captured near Tucson. (Lusk.)
24. *Strix occidentalis*. SPOTTED OWL.** — Breeds rather plentifully in the pine zone of the Catalinas. Taken by Lusk.
25. *Otus flammeolus*. FLAMMULATED SCREECH OWL.** — One taken at 8000 feet in the Catalinas by Lusk.
26. *Speotyto cunicularia hypogæa*. BURROWING OWL. — Several pairs nested in badger holes on the mesa east of Tucson.
27. *Glaucidium phalænoides*. FERRUGINOUS PYGMY OWL. — These birds were very common in the oak zone in June. An imitation of the soft cooing call brought one to a dead twig which hung within arm's length as I lay on my blankets.
28. *Micropallas whitneyi*. ELF OWL. — This, with the former, nests abundantly in the deserted holes of the Gila and Gilded Woodpeckers in the giant cacti, or suharo.

29. *Geococcyx californicus*. ROAD-RUNNER.— Abundant below 4000 feet most of the year. They have been seen leaving the nest of Gambel's Quails carrying an egg in their beak.

30. *Coccyzus americanus occidentalis*. CALIFORNIA CUCKOO.* — A common nester in the mesquite of the Santa Cruz bottoms near Tucson, arriving the second week of June and leaving early in September. Their call is feeble and resembles that of the Black-billed rather than that of the more closely related Yellow-billed Cuckoo. One was seen carrying a young lizard.

31. *Dryobates arizonæ*. ARIZONA WOODPECKER.*** — Breeds commonly in the oak zone. Nests found by Lusk.

32. *Xenopicus albolarvatus*. WHITE-HEADED WOODPECKER.**** — One seen at 7000 feet in the Catalinas May 26. I believe that this bird has not been hitherto recorded from Arizona. Although I did not secure it, identification could scarcely be doubtful.

33. *Sphyrapicus thyroideus*. WILLIAMSON'S SAPSUCKER.— A nest with young found May 25 in the oak zone of the Catalinas.

34. *Antrostomus vociferus macromystax*. STEPHENS'S WHIP-POOR-WILL. — A conspicuous summer resident in the pine zone of the mountains.

35. *Phalaenoptilus nuttalli nitidus*. FROSTED POOR-WILL.** — While *nuttalli* breeds only in the mountains, this variety is abundant throughout the summer in the valley. Specimens of both have been taken by Lusk.

36. *Chordeiles acutipennis texensis*. TEXAN NIGHTHAWK.*** — An abundant summer resident in the Lower Sonoran Zone — the valley. Flight is low, almost always within twenty feet of the ground. The only call, soft and bubbling, is heard at dusk only in the early summer.

37. *Aëronautes melanoleucus*. WHITE-THROATED SWIFT.*** — Nests abundantly about the cliffs in the mountains. A few feed in the valley.

38. *Eugenes fulgens*. RIVOLI HUMMINGBIRD.** — Tolerably common breeder above 6000 feet in the Catalina. (Lusk.)

39. *Archilochus alexandri*. BLACK-CHINNED HUMMINGBIRD.* — The only common hummer in March and April. Apparently winters in the lowlands.

40. *Calypte costæ*. COSTA'S HUMMINGBIRD.* — The abundant summer hummer of the town of Tucson is Costa's.

41. *Selasphorus platycercus*. BROAD-TAILED HUMMINGBIRD.— Mr. Lusk says that this is the most numerous hummer breeding in the Catalinas.

42. *Selasphorus rufus*. RUFOUS HUMMINGBIRD.— Lusk believes this species does not nest in the Catalinas.

43. *Stellula calliope*. CALLIOPE HUMMINGBIRD.— Common migrant at 7500 feet. (Lusk.)

44. *Cynanthus latirostris*. BROAD-BILLED HUMMINGBIRD.* — This beauty was breeding abundantly at 3500 feet in Sabino Cañon, in the Catalinas, early in May. Mr. Lusk says they rear another brood in July and August above 7000 feet.

45. *Basilinna leucotis*. WHITE-EARED HUMMINGBIRD.— Mr. H. S.

Swarth shot one in the Santa Rita Mountains in 1903. He announced this in 'The Condor' for 1903. I saw one under very favorable conditions at 3000 feet in the Catalinas May 4.

46. *Tyrannus vociferans*. CASSIN'S KINGBIRD.— Abundant breeder about Tucson, arriving the last of April.

47. *Myiodynastes luteiventris*. SULPHUR-BELLIED FLYCATCHER.** — One pair nested at 5000 feet in Pima Cañon, Catalina Mountains, in 1909. Lusk met a pair in Cañon de Ordo on the north side of the range in 1907.

48. *Myiarchus cinerascens*. ASH-THROATED FLYCATCHER.— Call starts out like that of the Crested but has a peculiar ring at its close.

49. *Myiarchus lawrencei olivascens*. OLIVACEOUS FLYCATCHER.— Seen repeatedly at 3500–4500 feet in the cañons of the Catalinas. Also noted near Tucson in the spring migration.

50. *Sayornis saya*. SAY'S PHOEBE.* — A regular though not frequent breeder near Tucson as well as in the mountains. The fledglings have a puttering call suggesting that of the Bluebird.

51. *Contopus pertinax pallidiventris*. COUES'S FLYCATCHER.*** — Called by the Mexicans "the Joseph and Mary bird" because its wonderfully sweet song might be interpreted "Hosea-Maria." Very abundant in the pine forests. Before light, and in the evening they are heard in every direction.

52. *Empidonax difficilis*. WESTERN FLYCATCHER.— Common breeder throughout the mountains from 3000–8000 feet.

53. *Empidonax traillii*. TRAILL'S FLYCATCHER.*** — Locally an abundant summer resident in the mesquite along the Santa Cruz River.

54. *Empidonax wrighti*. WRIGHT'S FLYCATCHER.* — "Probably a rare breeder in the Pine Zone." (Lusk.)

55. *Empidonax fulvifrons pygmaeus*. BUFF-BREASTED FLYCATCHER.** — Three pairs bred in the pines of the Catalinas at 7500 feet in 1909. Nests found by Mr. Lusk.

[*Ornithion ridgwayi*. RIDGWAY'S FLYCATCHER.— Mr. H. S. Swarth in his list of summer birds of the Papagoe Indian Reservation (Condor, 1903) tells of the capture of a brood of these rare birds.]

56. *Otocoris alpestris adusta*. SCORCHED HORNED LARK.— Locally a tolerably common resident on the mesa.

57. *Nucifraga columbiana*. CLARKE'S NUTCRACKER.** — Occasionally abundant in the pine and red fir forests of the Catalinas. (Lusk.)

58. *Molothrus ater obscurus*. DWARF COWBIRD.* — A summer resident as high as 5000 feet in the oaks. Arrived May 5.

59. *Tangavius æneus æneus*. WESTERN RED-EYED COWBIRD.**** — At least three pairs spent the summer on the bottom just west of Tucson, and at least four young were matured. For the announcement of the capture see 'The Auk' for July, 1909. For further notes see 'The Auk' for April, 1910, p. 210.

60. *Xanthocephalus xanthocephalus*. YELLOW-HEADED BLACKBIRD.*** — Nests in the valley.

61. *Agelaius phoeniceus sonoriensis*. SONORA REDWING.— Lacking rushes in which to build their nests they place them in mock orange trees along the usually dry irrigation ditches.

62. *Sturnella magna hoopesi*. RIO GRANDE MEADOWLARK.— Abundant winter visitor. One pair spent the summer in one of the few large alfalfa fields. There is no noticeable difference in the songs of this and *S. neglecta*.

63. *Icterus parisorum*. SCOTT'S ORIOLE.— Seen frequently migrating at Tucson. An abundant summer resident of the oak zone in the Catalinas. Their loud, ringing whistle, suggesting the "I-want-to-speak-to-you" call of the Western Meadowlark, was the most noticeable bird note there in June.

64. *Icterus cucullatus nelsoni*. ARIZONA HOODED ORIOLE.— Abundant breeder. They have two songs; the louder and more frequent resembles that of Yellow-headed Blackbird. The other is sung in an undertone and strongly suggests a distant Bobolink. The nest is almost as pendant as that of the Baltimore. I found several between and under the ribs of the leaves of the fan-leaved palm.

65. *Icterus bullocki*. BULLOCK'S ORIOLE.— Common summer resident to 4000 feet, all leaving by the middle of July. Arrivals from the north noted September 12.

66. *Hesperiphona vespertina montana*. WESTERN EVENING GROSBELK.*** — Three pairs nested at 7500 feet in the Santa Catalinas in 1909, and at 9000 feet in 1906. Nests found in 1906 by E. O. Howard and in 1909 by Lusk.

67. *Carpodacus cassinii*. CASSIN'S PURPLE FINCH.— Regular migrant in the mountains. (Lusk.)

68. *Passer domesticus*. ENGLISH SPARROW.** — Now fairly numerous about Tucson, and also Phoenix.

69. *Spinus pinus*. PINE SISKIN.* — A flock seen near Tucson in March. "Abundant in August and September, 1909, at 8000 feet." (Lusk.)

70. *Rhynchophanes mccowni*. MCCOWN'S LONGSPUR.** — One collected by Lusk at Old Fort Lowell October 1, 1900.

71. *Poœcetes gramineus confinis*. WESTERN VESPER SPARROW.* — A common migrant, March to May, and September 15 to October at Tucson.

72. *Ammodramus bairdi*. BAIRD'S SPARROW.** — Fairly numerous for a few days late in April near Tucson.

73. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW.— An abundant winter visitor. They remain several weeks longer than *Z. gambeli* feeding on the blackberry like fruits of the mulberry. Last seen June 8.

74. *Zonotrichia leucophrys gambeli*. GAMBEL'S SPARROW.— Common winter visitor, arriving September 23 and leaving May 13.

75. *Spizella passerina arizonæ*. WESTERN CHIPPING SPARROW.— Abundant migrant in the basin.

76. *Spizella breweri*. BREWER'S SPARROW.** — Several noted in April near Tucson. Taken by Lusk.

77. *Junco phæonotus palliatus*. ARIZONA JUNCO.*** — Abundant breeder in the pine and spruce zones of the mountains. This is the only common Junco of the five noted. Its jolly trill was frequently heard, especially in the aspen thickets above 8000 feet.

78. *Amphispiza bilineata deserticola*. DESERT SPARROW. — This is doubtless about as truly a desert bird as any sparrow, and apparently it must go for long intervals without water, for there is no rain nor dew from March, and sometimes February, to the end of June or even the middle of July. However, this somber bird with a cheery trill knows how to drink. I have frequently watched them drink, in June, from a pan which I had placed out. One thirsty fellow took a score of sips before being sated.

Other typical desert birds I noted drinking are: Bendire's Thrasher, Cactus Wren, House Finch, and Gambel's Quail.

79. *Aimophila carpalis*. RUFOUS-WINGED SPARROW. — A brood seen at 5000 feet late in June in the Catalinas.

80. *Aimophila ruficeps scotti*. SCOTT'S SPARROW. — A tolerably common migrant in April in the Santa Cruz valley.

81. *Melospiza melodia fallax*. DESERT SONG SPARROW. — Noted in March and April occasionally. Fairly frequent after the middle of September.

82. *Pipilo fuscus mesoleucus*. CAÑON TOWHEE. — The only abundant summer resident towhee below 5000 feet. Song, *chibe, chibe, chibe, chibe, chib*; instead of *chib, chib, chib* as given in Chapman and Reed.

83. *Oreospiza chlorura*. GREEN-TAILED TOWHEE.*** — Very common in the bottoms in April and September. "Occasionally breeds at low altitudes." (Lusk.)

84. *Pyrrhuloxia sinuata*. ARIZONA PYRRHULOXIA. — Abundant resident about Tucson; frequent at the mouths of the cañons. It has two quite distinct whistles. One is like that of the Cañon Towhee. The other is sharp and very loud. The first song season closes early in May, and the second commences early in June.

85. *Zamelodia melanocephala*. BLACK-HEADED GROSBEEK.*** — Breeds up to 8000 feet. In the valley sparingly, abundantly in the mountains where its sweet song was the dominant notes at midday in June.

86. *Guiraca caerulea lazuli*. WESTERN BLUE GROSBEEK.*** — Common summer resident at Tucson. Arrived May 22 and departed September 28. Its cheery though unambitious song is uttered indifferently from telephone wires or from weeds and mesquite.

87. *Passerina amoena*. LAZULI BUNTING. — Abundant April 13 to end of May in the valley, and in August and September.

88. *Cyanospiza versicolor*. VARIED BUNTING.** — A flock of ten was seen near Tucson May 4. (Brewster, in Auk, 1885, records the capture of a specimen by Stephens south of Tucson.)

89. *Piranga ludoviciana*. WESTERN TANAGER.* — Migrant, feeding on mulberries in spring, near Tucson. Abundant summer resident in the bull pine forest. Song is harsher than that of the following species.

90. *Piranga hepatica*. HEPATIC TANAGER.* — Common migrant about Tucson, and tolerably common summer resident above 6000 feet in the Catalinas. It has the song and sharp call of the Scarlet Tanager. April 29–September 18.

91. *Piranga rubra cooperi*. COOPER'S TANAGER.— A common breeder along ditches in the Santa Cruz Valley. April 22–August 22. Its song is far sweeter than that of the other tanagers. It has a purity which suggests the Rose-breasted Grosbeak. The alarm note is also softer.

92. *Progne subis hesperia*. WESTERN MARTIN.— Very abundant about Tucson in summer, nesting in holes made by the Gila Woodpeckers and the Flickers in the giant cacti. From August 1 to September 20 large flocks were seen daily.

93. *Petrochelidon lunifrons*. CLIFF SWALLOW.** — A few seen at Tucson the last of March.

94. *Iridoprocne bicolor*. TREE SWALLOW.— Seen several times in March and April in the valley.

95. *Tachycineta thalassina lepidia*. VIOLET-GREEN SWALLOW.— Seen in large flocks in spring, March 25 to April 8, and in the fall, September 8 in valley; abundant nester in the pines.

96. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.— By far the most abundant breeding swallow about Tucson in 1909. Left (July 2) after breeding.

97. *Lanivireo solitarius cassini*. CASSIN'S VIREO.* — An uncommon migrant along the river as well as in the mountains.

98. *Lanivireo solitarius plumbeus*. PLUMBEOUS VIREO.* — A frequent migrant near Tucson; first seen April 6. "Fairly common breeder in the mountains." (Lusk.)

99. *Vireo huttoni stephensi*. STEPHENS'S VIREO.— "Nests twice at 5000 feet in the Catalinas. First brood is out by May 1 and second by July." (Lusk.)

100. *Vireo belli pusillus*. LEAST VIREO.— Common summer resident in valley. Song resembles that of the Yellow Warbler.

101. *Vermivora virginiae*. VIRGINIA'S WARBLER.— Nest found by Mr. Lusk at 7500 feet in the Catalinas.

102. *Vermivora celata lutescens*. LUTESCENT WARBLER.— Common breeder throughout the region. I have found nests in the valley and Mr. Lusk in the forests of the mountains.

103. *Peucedramus olivaceus*. OLIVE WARBLER.*** — Not a rare nester in the higher reaches of the Catalinas. Nests found by Mr. Lusk. He believes that the males do not attain the brightest coloration until at least the third year. Also that the young males sing only snatches of the flowing song of the bright colored adults.

104. *Dendroica auduboni nigrifrons*. BLACK-FRONTED WARBLER.** — Although it is *auduboni* which is so abundant in the lowlands, this is the common resident of the tops of the mountains, where Mr. Lusk has taken nests. *Auduboni* was seen in the lowland as late as the end of May and doubtless nests not far distant.

105. *Dendroica gracise*. GRACE'S WARBLER.*** — Abundant nester above 7000 feet in the Catalinas. This is a ground loving bird, hopping sprightly about. A connected song which tapers off as does the House Wren's is often delivered from a low perch.

106. *Dendroica nigrescens*. BLACK-THROATED GRAY WARBLER.* — Frequent migrant in the valley (March 26–April 14, September). Common summer resident above 6000 feet.

107. *Dendroica townsendi*. TOWNSEND'S WARBLER.* — Noted in March and May near Tucson, and at base of the Catalinas at middle of September.

108. *Dendroica occidentalis*. HERMIT WARBLER. — A pair were seen along the river April 22. "Common migrant in the Catalinas." (Lusk.)

109. *Oporornis tolmiei*. MACGILLIVRAY'S WARBLER. — Common in migrations. Seen early in June near the river, apparently near its nest.

110. *Icteria virens longicauda*. LONG-TAILED CHAT. — The Chat arrived in great numbers late in May. At sunrise I have heard scores singing simultaneously. Departed first week of September.

111. *Wilsonia pusilla pileolata*. PILEOLATED WARBLER. — Abundant migrant March 24–June 2, August 18. The song is very much like that of the Yellow Warbler.

112. *Setophaga picta*. PAINTED REDSTART. — A common summer resident in the forests of the Catalinas. Nests found by Mr. Lusk at 7500 feet. From June 20 to September 18 the immature birds were abundant in the oak zone and along the cañons.

113. *Cardellina rubrifrons*. RED-FACED WARBLER.*** — Common nester in the pine forest. Nest found by Mr. Lusk.

114. *Toxostoma curvirostre palmeri*. PALMER'S THRASHER. — Common resident below 4000 feet. Mr. Couch was correct in saying that the song is "remarkably melodious and attractive," and because it is soft and not very frequent it is all the more pleasing.

115. *Toxostoma bendirei*. BENDIRE'S THRASHER. — Abundant resident about Tucson. Song resembles that of the Brown Thrasher. The song season is over by mid-April, and the young then fledged. The birds of this region do not seem to adapt their nesting period to the rainy seasons. There is a small amount of rain in December and January; then everything slowly dries up until July and August when considerable rain falls. In these months the insect life and all other food is far more abundant than before. One would think that the birds of this region would therefore have their young hatched early in July instead of in May. Characteristic desert birds which bring out their broods early are:

Mid-April: Bendire's Thrasher and Cactus Wren (the latter occasionally rears a second brood in August).

Early in May: Plumbeous Gnat-catcher.

Mid-May: Say's Phoebe, Vermilion Flycatcher, Desert Sparrow.

End of May: Mourning Dove, Bullock's Oriole, House Finch, Lutescent Warbler.

Mid-June: Gambel's Quail, Palmer's Thrasher.

116. *Catherpes mexicanus conspersus*. CAÑON WREN.—A common resident about the lava hills in the valley as well as in the mountains, where it is abundant up to 6500 feet. Song very loud and ringing; *che*, repeated six times on an ascending scale and ending with a squeak.

117. *Thryomanes bewicki leucogaster*. BAIRD'S WREN.—Common migrant and rare breeder in the valley, abundant in the oak zone. Song distinctly suggests that of the eastern Towhee.

118. *Troglodytes ædon parkmani*. WESTERN HOUSE WREN.* — Tolerably frequent in March, April and September in the valley; abundant summer resident above 7000 feet in the Catalinas.

119. *Certhia familiaris albescens*. MEXICAN CREEPER.*** — Abundant at 7500 feet in the pines of the Catalinas in June; apparently nesting.

120. *Sitta pygmæa*. PYGMY NUTHATCH.*** — One seen near Tucson April 10. "A fairly frequent nester in the pine forests." (Lusk.)

121. *Penthestes sclateri*. MEXICAN CHICKADEE.** — "Common nester in the pines" (Lusk.) Seen in the oak zone in April.

122. *Regulus calendula*. RUBY-CROWNED KINGLET.*** — Abundant until the end of April at low altitudes. "Breeds in the Catalinas above 8000 feet." (Lusk.)

123. *Myadestes townsendi*. TOWNSEND'S SOLITAIRE.—Several seen at 6000 feet in the Catalinas early in April. Mr. Lusk says they occasionally breed at about that altitude.

124. *Hylocichla guttata auduboni*. AUDUBON'S HERMIT THRUSH.*** — Early in June their song was heard repeatedly, especially in the fir forested valleys above 8000 feet.

125. *Planesticus migratorius propinquus*. WESTERN ROBIN.*** — Several pairs nest, quite after the fashion of the eastern bird, about the scattered cabins and clearings in the coniferous zone of the Catalinas. A Robin is occasionally seen on the lawns of Tucson.

126. *Sialia mexicana occidentalis*. WESTERN BLUEBIRD.—"Rare breeder in the spruces at 9000 feet in the Catalinas." (Lusk.)

127. *Sialia mexicana bairdi*. CHESTNUT-BACKED BLUEBIRD.** — Abundant breeder in the pines. Taken by Lusk.

THE BLACK-THROATED GREEN WARBLER.

BY CORDELIA J. STANWOOD.

Plates XIII and XIV.

THE Black-throated Green Warbler is the light opera of the birds. When he is in the treetops I find myself unconsciously humming the words that suggest his two common ditties, they are so marked in time and catchy. His voice is suggestive of the drowsy summer days, the languor of the breeze dreamily swaying the pines, spruces, firs and hemlocks. It recalls the incense of evergreens, the fragrance of the wild strawberry, the delicate perfume of the linnea. No other bird voice is so potent to evoke that particular spell of the northern woods.

At Ellsworth, Maine, the Black-throated Green Warbler is one of the early warblers to arrive in the spring. It comes just as the buds of the larch are opening, and is always to be looked for in or near swamp growths, where gray birch, larch, and evergreens flourish. After the nest is completed, there is a long period of nearly two months when the song of the Black-throated Green and Magnolia Warblers can be heard at any time of the day in the high tops of primeval spruces and pines. In the early part of the season the Black-throated Green Warbler feeds all over any kind of tree but prefers deciduous; in the fall they frequent these same growths, where the swamps at this season are often dry. At this time of year, they sometimes descend to the ground and forage among the newly fallen leaves.

The bird is quick in its movements, but often spends periods of some length on one tree, frequently coming down low to peep inquisitively at an observer, once in a while flying toward a person as if to alight on his hand or head. This mark of curiosity is shown by both the Magnolia and the Black-throated Green, particularly during migration.

Two common songs of the Black-throated Green Warbler are easily suggested by words; a third, less common, is not so easily reduced to syllables. The first is always readily recalled by the words *read-y, stead-y, read-y, stead-y*. The second, by the words *sweet, O, how sweet, sweet, sweet, O how sweet*; or again, *take it,*

take it, lei-sure-ly; take it, take it, lei-sure-ly. What I speak of as the third song, I have heard only in one locality as if sung by but one bird. At different times I have translated it in three syllables, *chee, chee, chee, read-y; te, te, ti, de-ee;* or *sui, sui, sui, su-i.* By some each translation might be regarded as a separate song.

It was in the twilight that I came upon the beautiful, fragile little nest of the Black-throated Green Warbler for the first time. On hasty inspection it looked like a mass of moss. A closer investigation showed the suggestive moss-like mass to be a nest, shaped almost as gracefully as a Tiffany vase. It was located on the border of a swamp, in the vertical crotch of a hemlock, about six feet from the ground. I could just touch the eggs with the tips of my fingers. To see them, I had to climb the neighboring tree.

There were three eggs in the nest, creamy-white, minutely speckled all over with reddish brown dots, and ringed with reddish-brown around the larger end. On one of the eggs the spots were confluent. The eggs were small and broad like the Magnolia Warbler's.

The nest was well set down into the crotch of a branch. It could be lifted out of the support very easily as it was not attached to any of the twigs. The sides were deeply grooved by the surrounding stems, the material bunching out between them. The foundation of the structure was spruce twigs, cedar bark fibre, spider's silk, cord, thin strips of white birch bark, and roots; the lining consisted of cedar bark fibre, roots and hay. One might almost say the material was miscellaneous. The nest was so fragile that the light shone through the walls in many places. The hemlock foliage well concealed the tiny abode from any but an inquisitive observer.

June 19 (1907), there were four eggs in the nest, and the bird was sitting. I walked back and forth under the tree and talked to her for some time before she would abandon her charge. As I climbed the next tree for a peep at the eggs, the bird scolded me somewhat and acted a little as if she were going to fly at me. She alighted within three feet of where I was sitting. I slipped down out of the tree and sat a yard or so away, and the bird returned to her duties again immediately.

On the fourth day when I visited the neighboring tree, the little bird flew to a branch within a foot of my face, not showing the least alarm. While she was perched beside me, I could not resist talking to her. The little creature chirped softly as if to say, "I don't like to have you here, but since you are, did you ever see such a lovely nest, and such beautiful eggs?"

In twelve days, on July 1, the beautiful little mother had completed the task of incubation. A few seconds after I appeared under the tree, the bird fell from the nest heavily to the ground, like a dead weight. She acted as if she were lame, and her wing broken. In this way she crept along some ten or fifteen feet. As I turned to get down out of the tree, I saw her on the ground, apparently helpless; when I reached the foot of the tree, she was in the branches looking most deliberately for food. When the female was feigning helplessness, her colors seemed much brighter than usual. She looked like an emerald set in gold, a winged gem.

On the third day the young birds were growing rapidly, burnt-orange in color, covered with an abundant supply of burnt-umber down. The quills and pin feathers showed blue-gray through the skin, and the eyes were just beginning to open.

On the seventh day the nestlings were large and well covered with grayish olive brown feathers on the back. They had buffy wing bars and were grayish-yellow-white underneath. Both birds scolded me severely, particularly the male bird. The female came very close and looked at me a great deal. Finally she dropped to a branch where she fluttered with an apparently broken wing, dropped helplessly to the ground, crawled along with seeming difficulty, but finally succeeded in dragging herself up onto a log. It was almost as if she said, "If you must take some one, take me." The birds chirped piteously until I left the neighborhood.

The eighth day the Black-throated Green Warblers were still in the nest, but when we attempted to arrange them slightly for a photograph, they all spilled over the side. We found three and put them back into the nest. During all this time the parent birds lingered around, sometimes scolding. Again the female clung to a branch with disabled wing. The moment we left the nest, the old birds returned to minister to the young. Tempting moths and caterpillars were thrust down their hungry little throats.

In the afternoon I returned and found the fourth fledgling perched on a flat rock in the sun. I attempted to return it to the nest, but just as it touched the side it gave a loud chirp that frightened the nestlings and the parent birds. The young dropped from the nest into the dry beech leaves and dwarf cornel foliage; the old birds were in a perfect frenzy. The mother bird poised herself in the air between me and the young and chirped in great distress. I decided to go at once without trying to explain my good intentions further.

The liquid prattle of young birds in the trees attracted me the next morning. Moving cautiously in that direction, I was startled by the loud scolding notes of the Black-throated Green Warbler. There was not the slightest doubt that the bird recognized me as her enemy of the day before. The little warblers were safe, and apparently very hungry, in the treetops.

May 25, 1908, I found two Black-throated Green Warblers building in the swamp. They were gathering bits of fine grass when I first noticed them, and flew to the fir where they were beginning a nest, rather reluctantly depositing the bits of hay with that foolish look birds assume when caught near the nest. First they laid knots of spider's silk and little curls of white birch bark in the shape of the nest, on the horizontal fork about midway of a branch six feet long. Next bits of fine grass, a little usnea moss, and cedar bark fibre. Both the male and female worked on the nest, until observed, the female shaping it with the breast each time they added a bit of material. Around the top were carefully laid the finest gray spruce twigs. These were bound together with masses of fine white spider's silk. The white curls of birch bark, the much weathered twigs, the fluffy shining bands and knots of spider's silk, made a very dainty looking structure. After the first morning, I did not see the male about the nest. As a general thing, I find that, if birds are observed building, the male usually leaves his part of the work to the female. The lady bird continued to shape the nest with her breast, turning around and around, as if swinging on a central pivot, just her beak and tail showing above the rim. If I came too near, she stood up in the nest as if to fly. If I withdrew to a respectful distance, say three yards, she went on with her work of shaping the nest. On

the second day the rim of the nest seemed about completed. It was narrower than the rest of the cup and beautifully turned. Nothing to speak of had been done to the bottom. On the fourth day, by touching the inside of the nest with the tips of my fingers, I judged that the lining was about finished. It consisted of rabbit-hair and horse-hair, felted or woven together so as to be very thick and firm. Between the foundation of twigs and bark and the hair lining was a layer of fine hay of which the mouth of the nest was chiefly shaped. I never saw a more substantial looking little nest. It was also one of the most beautiful I have ever found, a perfect harmony in grays.

After the fourth day I never surprised the birds in the vicinity of the nest. I began to fear that they had deserted. It was not until the 6th of June that I found the first egg. The four eggs were laid on four consecutive days, before 9 A. M., and the bird began to incubate before 10.30 A. M. of the fourth day. By standing on a rock under the tree, and pulling the branch down slightly, I could just see the eggs. I went often to the nest during the twelve days the female was incubating. When I put my face almost against the nest and talked to her, she simply turned her head and looked at me, and chipped two or three times very gently. She would leave the eggs only when I put up my hand as if to touch her.

On the fourth day the eyes of the nestlings were open a narrow slit; the wing quills were one half inch long; the pin feathers were indicated on the feather tracts; and the whole bird had taken on a more or less dark-brown leathery appearance.

On the sixth day I remained a long time near the nest. The parent birds came with food. The male called *sint, sint* in a sharp metallic tone all the time I was there and refused to feed the young. After a time the female ceased scolding and brought food several times, and carried away excrement. Then she crouched on the side of the nest, holding on by her claws which were thrust firmly into the walls.

On the eighth day, the nest was simply stuffed full of little green-gray birds, strikingly like the color of the nest.

On the tenth day, I pulled the nest almost down to my face to see the wing bars of the nestlings. The old birds chirped a little but were not annoyed.

On the eleventh day, quite early in the morning, as I neared the nesting place, I heard the fledglings calling from the treetops. Soon I caught a glimpse of the Black-throated Green Warblers marshalling their little band away.

The nest measured, inside, $2\frac{1}{4}$ inches in length and $1\frac{3}{4}$ in width; outside, 4 inches in length, 3 in width, and 2 in depth.

The four nests of 1909 were of the two types before mentioned, those built in a crotch or with crotch-like effects, and those sitting on twigs connected with the branch. One was like the dainty gem-like structure of the year before but a bit more dainty, containing much more spider's silk; the bird was four days constructing the foundation, and four days felting together the lining of rabbit-hair, horse-hair and human-hair. She then rested a day before laying the first egg. The other three nests were less exquisitely curved and put together more clumsily; but if one had never seen the work of the gentle artist who executed the first, he would have been charmed with the clever skill of the modellers of the other three.

They were located from four to eight feet up, three in fir trees, one in a spruce. One of the nests of this year contained a fibrous bark other than cedar; two had a few feathers in the lining, and the other was lined with black plant fibre; the rest of the materials were similar to those in the second nest described.

NOTES ON THE SUMMER BIRDS OF KENTUCKY AND TENNESSEE.

BY ARTHUR H. HOWELL.

IN the course of field work for the Biological Survey during the seasons of 1908 and 1909 I visited a number of localities in Kentucky and Tennessee and made notes on the birds observed. Comparatively little time was spent at each locality, so that the lists are necessarily far from complete, but in view of the very limited amount of published information on the birds of these two States it seems best to place on record the results of my observations.

For the sake of convenience in future reference the lists from each State will be presented separately.

KENTUCKY.

In 1908, two localities in the extreme eastern part of the State were visited, namely: Big Black Mountain on July 24 and Barbourville, August 9-13. Big Black Mountain is in the eastern part of Harlan County, close to the Virginia line. It is a part of the Cumberland Range and is the highest mountain in the State (4100 feet). Barbourville is in Knox County, on the Cumberland River, at an altitude of about 1000 feet.

In 1909, five localities in the central and eastern parts of the State were visited, namely: Rockport, June 23, 24; Hawesville, June 25-28; Mammoth Cave, June 29-July 5; Midway, July 6-11; and Jackson, July 12-14.

The greater part of the State is in the Upper Austral Zone. The Lower Austral Zone is found in the extreme western part in the Mississippi and Ohio bottoms as far east as Paducah. The Transition Zone occupies only the summit of Big Black Mountain above 3000 feet and small isolated areas in the Cumberland Range at somewhat lower altitudes, in shaded ravines having a northern exposure. These narrow tongues of the Transition Zone reach in some places as low as 1600 feet.

List of Birds Observed.

Butorides virescens. GREEN HERON.—Several were seen at Midway, July 6–11.

Oryechus vociferus. KILLDEER.—At Midway, in July, a flock of twenty or thirty was observed for several days feeding about the wet spots in a tobacco patch.

Colinus virginianus. BOB-WHITE.—Common at Midway and other points in the lowlands; rather scarce in the foothill region, but a few were noted at Barbourville and along Clover Fork at the foot of Big Black Mountain.

Zenaidura macroura carolinensis. MOURNING DOVE.—Common at Midway; a few seen at Hawesville and Mammoth Cave.

Cathartes aura septentrionalis. TURKEY BUZZARD.—Several seen at Hawesville and Mammoth Cave.

Otus asio. SCREECH OWL.—One heard in Barbourville.

Coccyzus americanus. YELLOW-BILLED CUCKOO.—Rather common at Midway; one or two seen at Mammoth Cave.

Dryobates villosus auduboni. SOUTHERN HAIRY WOODPECKER.—Common at Barbourville, where one specimen of this subspecies was taken; one seen at Mammoth Cave.

Dryobates pubescens medianus. DOWNY WOODPECKER.—Several seen and one collected at Barbourville; one seen on Big Black Mountain at 3000 feet, others at Jackson, Midway, and Mammoth Cave.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—Common at Midway.

Centurus carolinus. RED-BELLIED WOODPECKER.—One seen at Hawesville, June 25.

Colaptes auratus luteus. NORTHERN FLICKER.—Common at Midway; scarce at Mammoth Cave and Barbourville; one seen at 3000 feet on Big Black Mountain.

Antrostomus vociferus. WHIPPOORWILL.—Several heard singing at Mammoth Cave, June 30.

Chaetura pelagica. CHIMNEY SWIFT.—Common at nearly all localities visited.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.—One seen at 2000 feet at base of Big Black Mountain; several at Barbourville and Mammoth Cave.

Tyrannus tyrannus. KINGBIRD.—A few seen at Barbourville; not observed at other localities.

Myiarchus crinitus. CRESTED FLYCATCHER.—Seen in small numbers at Mammoth Cave, Hawesville, Midway, and Jackson.

Sayornis phoebe. PHOEBE.—Numerous at Hawesville, nesting on cliffs; a few seen at Barbourville, Jackson, and Mammoth Cave; two at the summit of Big Black Mountain.

Myiochanes virens. WOOD PEWEE.—Common at Barboursville; a few observed at Jackson and Mammoth Cave, and on Big Black Mountain up to 4000 feet.

Empidonax virescens. ACADIAN FLYCATCHER.—Observed in small numbers at Mammoth Cave, Jackson, Barboursville, and the base of Big Black Mountain (2000 feet).

Otocoris alpestris praticola. PRAIRIE HORNED LARK.—A pair was seen in a public road at Midway, July 9, 1909.

Cyanocitta cristata. BLUE JAY.—Numerous at Rockport; a few seen at Midway, Mammoth Cave, and Barboursville.

Corvus brachyrhynchos. CROW.—Common at Midway; three or four seen at Barboursville. They are not partial to the foothill country.

Agelaius phoeniceus. RED-WINGED BLACKBIRD.—Common at Midway, where young able to fly well were seen July 6-11; ten or twelve seen in a small marsh at Barboursville.

Sturnella magna. MEADOWLARK.—Common at Midway and Rockport; ten or fifteen seen in a wet marsh at Barboursville, where they evidently breed.

Icterus spurius. ORCHARD ORIOLE.—A few seen at Rockport, Hawesville, and Midway.

Icterus galbula. BALTIMORE ORIOLE.—A few noted at Barboursville and one at Rockport.

Quiscalus quiscula. PURPLE GRACKLE.—A flock of 10 or 15 birds was seen at Barboursville and a specimen shot from this flock on August 12 proved to be of this form.

Quiscalus quiscula æneus. BRONZED GRACKLE.—Abundant at Midway, July 6-11, gathering in good sized flocks about the cultivated fields and roosting at night in large companies in the shade trees in town; one specimen was taken.

Astragalinus tristis. GOLDFINCH.—Numerous at Barboursville and about the base of Big Black Mountain; seen also at the summit of the mountain and at Jackson.

Poœcetes gramineus. VESPER SPARROW.—Several heard singing at Midway, July 6-11.

Ammodramus savannarum australis. GRASSHOPPER SPARROW.—Quite common at Midway and Barboursville; specimen taken at Midway.

Spizella passerina. CHIPPING SPARROW.—Fairly common at most localities in the lowlands and foothills; a small flock seen at the summit of Big Black Mountain.

Spizella pusilla. FIELD SPARROW.—Common, both on the mountains and in the lowlands.

Junco hyemalis carolinensis. CAROLINA JUNCO.—A few seen at the summit of Big Black Mountain (July 24) where they evidently breed; one young specimen taken.

Melospiza melodia. SONG SPARROW.—Abundant at Midway; several noted along the Ohio River at Hawesville, June 25. They apparently do

not occur in the breeding season much farther down the Ohio Valley, as none were found at Mount Vernon, Indiana; nor were any seen in the foothill region about Jackson, Kentucky.

Cardinalis cardinalis. CARDINAL.—Common at all localities in the lowlands; ranges up to at least 2500 feet on Big Black Mountain.

Zamelodia ludoviciana. ROSE-BREADED GROSBILL.—A full-grown young male was taken, July 24, at 2500 feet on Clover Fork, at base of Big Black Mountain.

Passerina cyanea. INDIGO BIRD.—Common in suitable situations at all localities; ranges to the top of Big Black Mountain.

Spiza americana. BLACK-THROATED BUNTING.—Quite common at Midway, July 6–11, but not seen elsewhere.

Piranga erythromelas. SCARLET TANAGER.—One noted at Rockport and several at Mammoth Cave.

Piranga rubra. SUMMER TANAGER.—A few seen at Barboursville, Jackson, Hawesville, and Mammoth Cave.

Progne subis. PURPLE MARTIN.—Common at Barboursville, Jackson and Midway; a few seen at Rockport and Hawesville.

Hirundo erythrogastra. BARN SWALLOW.—Common at Midway; four or five seen at Barboursville (August 9–13); at Mammoth Cave several pairs were nesting about the hotel buildings.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—Numerous at Hawesville along the Ohio River.

Vireosylva olivacea. RED-EYED VIREO.—Fairly common both in the lowlands and on the mountains.

Vireosylva gilva. WARBLING VIREO.—One seen and heard singing at Barboursville, August 9.

Lanivireo flavifrons. YELLOW-THROATED VIREO.—Rather common at Barboursville; a few noted at Jackson, Hawesville, and Mammoth Cave.

Lanivireo solitarius alticola. MOUNTAIN SOLITARY VIREO.—Common on Big Black Mountain from about 3400 feet to the summit. Several heard singing freely and two adult males taken.

Vireo griseus. WHITE-EYED VIREO.—One seen at base of Big Black Mountain; others at Barboursville, Jackson, and Hawesville.

Mniotilta varia. BLACK AND WHITE WARBLER.—Common at all altitudes on Big Black Mountain; a few seen at Barboursville, Jackson, and Hawesville.

Helminthos vermivorus. WORM-EATING WARBLER.—Scarce; one seen at Barboursville, and others at Hawesville and Mammoth Cave.

Compsothlypis americana ramalinæ Ridgway. WESTERN PARULA WARBLER.—Several heard singing at Jackson and at Mammoth Cave; specimens taken at each place are referable to this form.

Dendroica æstiva. YELLOW WARBLER.—Several seen at Jackson, and on Clover Fork at base of Big Black Mountain.

Dendroica cærulescens cairnsi. CAIRNS'S WARBLER.—Several seen on Big Black Mountain between 3400 and 4000 feet altitude; one young bird just able to fly taken at 4000 feet.

Dendroica cerulea. CERULEAN WARBLER.—One full-grown immature specimen was taken, July 24, at the summit of Big Black Mountain. Heard singing at Jackson, Hawesville, and Mammoth Cave.

Dendroica fusca. BLACKBURNIAN WARBLER.—Common in heavy timber at the summit of Big Black Mountain, July 24; two immature specimens taken.

Dendroica virens. BLACK-THROATED GREEN WARBLER.—Common at the summit of Big Black Mountain, July 24, where two immature specimens were taken. A full-grown immature bird was taken in the foothills at Jackson, July 14, at 1000 feet altitude.

Dendroica discolor. PRAIRIE WARBLER.—One taken at Barbourville August 10.

Seiurus aurocapillus. OVEN-BIRD.—One seen at 3000 feet altitude on Big Black Mountain; heard singing at Hawesville and Mammoth Cave.

Seiurus motacilla. LOUISIANA WATER-THRUSH.—Common along Clover Fork at base of Big Black Mountain; seen up to 3000 feet on the mountain; noted also at Jackson and Mammoth Cave.

Oporornis formosa. KENTUCKY WARBLER.—Fairly common at Mammoth Cave, Hawesville, Jackson, Barbourville, and on Big Black Mountain below 3000 feet.

Geothlypis trichas. MARYLAND YELLOW-THROAT.—Common at Barbourville, where moulting adults and young were taken, August 9-13; several noted on Clover Fork at base of Big Black Mountain; common at Midway and Jackson (specimen); noted at Rockport and Mammoth Cave.

Icteria virens. YELLOW-BREASTED CHAT.—Noted in small numbers at Barbourville, Jackson, Hawesville, and Mammoth Cave.

Wilsonia citrina. HOODED WARBLER.—Several seen on Big Black Mountain between 2000 and 3000 feet altitude; fairly common at Jackson, Hawesville, and Mammoth Cave.

Wilsonia canadensis. CANADIAN WARBLER.—One heard singing, July 24, at 3000 feet on Big Black Mountain.¹

Setophaga ruticilla. REDSTART.—Several seen between 3000 and 4000 feet on Big Black Mountain; one at Mammoth Cave.

Mimus polyglottos. MOCKINGBIRD.—Fairly common at Midway; a few seen at Hawesville, Mammoth Cave and Rockport.

Dumetella carolinensis. CATBIRD.—Common at Midway and Hawesville; a few seen at Mammoth Cave and Barbourville.

Toxostoma rufum. BROWN THRASHER.—A few seen at Midway and Barbourville.

Thryothorus ludovicianus. CAROLINA WREN.—Common at all localities; several seen at 3750 feet altitude, near the summit of Big Black Mountain.

Thryomanes bewicki. BEWICK'S WREN.—Seen in small numbers at Barbourville, Jackson, Hawesville, Midway, Rockport, and Mammoth Cave.

¹ A specimen was taken the day previous just across the line in Virginia (Big Stone Gap).

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—A few pairs were living in a small marsh at Barboursville, August 9-13; they probably breed there, but no nests were noticed.

Sitta carolinensis. WHITE-BREASTED NUTHATCH.—Several noted on Big Black Mountain between 3000 and 4000 feet altitude; one at Barboursville and one at Mammoth Cave.

Bæolophus bicolor. TUFTED TITMOUSE.—Common at Barboursville; several seen at Mammoth Cave.

Penthestes carolinensis. CAROLINA CHICKADEE.—Several noted at Barboursville and Mammoth Cave; immature specimens taken, July 24, at the summit of Big Black Mountain.

Poliophtila cærulea. BLUE-GRAY GNATCATCHER.—Common at Barboursville; a few noted at Mammoth Cave.

Hylocichia mustelina. WOOD THRUSH.—Common at Mammoth Cave and Jackson; one seen at Barboursville; several on Big Black Mountain between 2000 and 3000 feet.

Planesticus migratorius achrusterus. CAROLINIAN ROBIN.—Common at Midway (specimen taken) and Mammoth Cave; one noted at Barboursville; said to nest on the summit of Big Black Mountain, but I saw none.

Sialis sialis. BLUEBIRD.—Fairly common at Barboursville and Mammoth Cave.

TENNESSEE.

The following localities in Tennessee were visited in the summer of 1908:

Briceville, Coal Creek, and Cross Mountain, August 14-19; High Cliff, August 20-22; Soddy, and Walden Ridge west of Soddy, August 25-29; Lawrenceburg, September 12-15.

Cross Mountain (3550 feet) is the highest point on the Cumberland Range in Tennessee, and is situated about three miles north-west of Briceville, on the boundary between Anderson and Campbell counties. High Cliff is in Campbell County, about three miles east of Jellico, at the point where the Clear Fork of the Cumberland emerges from the cañon which it follows through the mountains. The altitude of the valley at High Cliff is 1000 feet, and Pine Mountain at this point reaches an altitude of 2100 feet. Soddy (Rathburn Station) is at the east base of Walden Ridge, about 18 miles northeast of Chattanooga. Walden Ridge is a fairly level plateau varying in altitude from 1500 to 2400 feet, and at this point is about 10 miles wide.

The greater part of eastern Tennessee is included in the Upper Austral Zone. The Transition Zone is found mainly on the mountain summits above 3000 feet and in cool gulches down to 2000 feet. In a few isolated localities (as at High Cliff) the zone appears on steep north slopes as low as 1000 feet. The Lower Austral Zone covers the western part of the State as far east as Lawrence County.

List of Birds Observed.

Butorides virescens. GREEN HERON.—One seen, August 26, on the lower part of Soddy Creek, near the Tennessee River.

Colinus virginianus. BOB-WHITE.—Scarce in the mountains; a few noted at High Cliff and at Coal Creek and one seen on top of Cross Mountain; fairly common on Walden Ridge and at Lawrenceburg.

Bonasa umbellus. RUFFED GROUSE.—Occurs sparingly on Walden Ridge, but through constant persecution has been greatly reduced in numbers during recent years. In the region about Cross Mountain, grouse are now very scarce, though formerly common.

Meleagris gallopavo silvestris. WILD TURKEY.—Occurs in moderate numbers on Walden Ridge, but is fast disappearing, as it is shot at all seasons by the residents. Two men told of killing all but one from a bunch of six or seven the day before I arrived.

Zenaidura macroura carolinensis. MOURNING DOVE.—Fairly common at Lawrenceburg and on Walden Ridge.

Cathartes aura septentrionalis. TURKEY BUZZARD.—Fairly common throughout the State.

Catharista urubu. BLACK VULTURE.—Three or four seen at Lawrenceburg, September 12–15; said to occur on Walden Ridge only in winter.

Falco sparverius. SPARROW HAWK.—A pair was seen on the summit of Cross Mountain; not observed elsewhere.

Otus asio. SCREECH OWL.—One was heard calling at Briceville and another at Lawrenceburg.

Ceryle alcyon. BELTED KINGFISHER.—Several seen at Lawrenceburg.

Dryobates villosus auduboni. SOUTHERN HAIRY WOODPECKER.—Fairly common on Cross Mountain and the surrounding valleys; specimens taken there and one at High Cliff prove to be the southern form.

Dryobates pubescens medianus. DOWNY WOODPECKER.—Two specimens taken at 3400 feet on Cross Mountain; several seen on Walden Ridge.

Phloeotomus pileatus. PILEATED WOODPECKER.—Common on Walden Ridge where I heard six or eight and shot one in a day's walk; a few were noted also on Cross Mountain.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—One immature bird seen on the summit of Cross Mountain, August 15.

Colaptes auratus luteus. NORTHERN FLICKER.— Not common; a few noted at High Cliff, Walden Ridge, Lawrenceburg, and Briceville; one specimen taken on the summit of Cross Mountain.

Antrostomus vociferus. WHIP-POOR-WILL.— One heard singing at Briceville, August 14.

Chordeiles virginianus. NIGHTHAWK.— One seen at Briceville, August 14; a flock of 15 or 20 seen near Knoxville, August 23.

Chaetura pelagica. CHIMNEY SWIFT.— Rather scarce at Briceville; two or three seen about the summit of Cross Mountain, August 15; common at Lawrenceburg, September 12–15; at Knoxville, on August 23 they were abundant over the city and I had an opportunity to observe their method of going to roost. About 6 P. M. I noticed the swifts all gathered into one immense flock and circling about in the vicinity of the Colonial Hotel. They moved mainly in one direction, but occasionally turned and circled for a few minutes in the opposite direction. They were evidently interested in a large square chimney on a mantel manufactory near the hotel, for this was the center of their constantly narrowing circle, and frequently one or more would dart down and make a feint to enter the chimney, only to dash off again and join the flock. At 6.25 they began to go in, and with the exception of a few intervals of less than 30 seconds, there was a constant stream of swifts entering the chimney for 13 minutes. At 6.38 the last ones went in, and only four or five Purple Martins remained in the air. I estimated the number of swifts at about 5000, but there may have been many more than that. How so many were able to find a resting place in a single chimney remains to me a mystery.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.— Several seen at Briceville and one at High Cliff.

Tyrannus tyrannus. KINGBIRD.— The only one observed was near Coal Creek, August 19.

Sayornis phoebe. PHEBE.— A few observed at each locality visited.

Myiochanes virens. WOOD PEWEE.— Common both on the mountains and in the valleys.

Empidonax virescens. ACADIAN FLYCATCHER.— A few noted in the region about Briceville.

Cyanocitta cristata. BLUE JAY.— Common at Lawrenceburg; a few noted at High Cliff and on Walden Ridge.

Corvus corax principalis. NORTHERN RAVEN.— Ravens are reported to occur in small numbers on Walden Ridge, where they live in the wild, rough gulches.

Corvus brachyrhynchos. CROW.— Seen in small numbers at High Cliff, Walden Ridge, and Lawrenceburg.

Sturnella magna argutula. SOUTHERN MEADOWLARK.— Three seen and one taken, September 10, at Fayetteville, where they evidently breed; they are said so occur at Soddy and on Walden Ridge only in winter.

Quiscalus quiscula. PURPLE GRACKLE.— Large flocks were seen at Fayetteville, September 10; one specimen taken here was of this form,

but doubtless *æneus* was well represented also. No Grackles were observed in east Tennessee.

Astragalinus tristis. GOLDFINCH.—Fairly common at Briceville, High Cliff, and Soddy.

Spizella passerina. CHIPPING SPARROW.—Fairly common at High Cliff and Cross Mountain.

Spizella pusilla. FIELD SPARROW.—Common at High Cliff, Cross Mountain, and on Walden Ridge.

Pipilo erythrophthalmus. TOWHEE.—Several noted at the summit of Cross Mountain and on Walden Ridge, at both of which localities it breeds; seen at Lawrenceburg, August 12-15.

Cardinalis cardinalis. CARDINAL.—Fairly common at all localities visited; seen at 2500 feet on Cross Mountain.

Piranga erythromelas. SCARLET TANAGER.—Several noted at about 2000 feet on Cross Mountain, where it breeds.

Piranga rubra. SUMMER TANAGER.—Observed in small numbers at High Cliff, Briceville, Soddy, and Lawrenceburg.

Progne subis. PURPLE MARTIN.—Breeds commonly on Walden Ridge; said to leave for the south about August 1; four or five were seen at Knoxville, August 23, with a large flock of Chimney Swifts.

Vireosylva olivacea. RED-EYED VIREO.—A few noted near Briceville.

Lanivireo flavifrons. YELLOW-THROATED VIREO.—Several seen and one taken at the summit of Cross Mountain, August 17; heard singing at High Cliff, August 22 and at Lawrenceburg, September 14.

Vireo griseus. WHITE-EYED VIREO.—A few noted at Coal Creek and High Cliff; heard singing at Lawrenceburg, September 14.

Mniotilta varia. BLACK AND WHITE WARBLER.—Fairly common at all altitudes on Cross Mountain; one seen at High Cliff, August 21.

Helmitheros vermivorus. WORM-EATING WARBLER.—One seen at 3400 feet on Cross Mountain.

Dendroica caerulescens cairnsi. CAIRNS'S WARBLER.—Two males were taken August 15 and 17 at 3400 feet on Cross Mountain; they probably breed on the mountain.

Dendroica pensylvanica. CHESTNUT-SIDED WARBLER.—One specimen taken August 25 on Walden Ridge.

Dendroica virens. BLACK-THROATED GREEN WARBLER.—Six or more were seen at 3400 feet on Cross Mountain; an adult female and immature specimens were taken, August 15 and 17; they undoubtedly breed there. One or two were seen on Walden Ridge, August 27.

Dendroica discolor. PRAIRIE WARBLER.—Two seen and one taken on Walden Ridge, August 27.

Seiurus aurocapillus. OVENBIRD.—Several pairs were seen between 1000 and 3300 feet on Cross Mountain.

Seiurus motacilla. LOUISIANA WATER-THRUSH.—Two or three were seen near Briceville.

Oporornis formosa. KENTUCKY WARBLER.—A few seen at Briceville and Soddy; one taken at 3400 feet on Cross Mountain.

Geothlypis trichas. MARYLAND YELLOW-THROAT.— One specimen taken at Briceville; others noted at High Cliff and Lawrenceburg.

Wilsonia citrina. HOODED WARBLER.— Common on Cross Mountain to 3400 feet; a few noted at High Cliff and in the gulches on Walden Ridge.

Mimus polyglottos. MOCKINGBIRD.— Common at Fayetteville and Lawrenceburg; not observed in eastern Tennessee.

Dumetella carolinensis. CATBIRD.— Fairly common at Briceville, Soddy, and Lawrenceburg.

Toxostoma rufum. BROWN THRASHER.— A few seen at each locality visited.

Thryothorus ludovicianus. CAROLINA WREN.— Common, both in the valleys and up to 3500 feet on Cross Mountain.

Thryomanes bewicki. BEWICK'S WREN.— Observed in small numbers at Briceville, High Cliff, Soddy, and Lawrenceburg.

Sitta carolinensis. WHITE-BREASTED NUTHATCH.— A few seen at High Cliff, Walden Ridge, and Cross Mountain (1000 to 3400 feet).

Baeolophus bicolor. TUFTED TITMOUSE.— Noted in small numbers at each locality visited; fairly common on Cross Mountain up to 3000 feet.

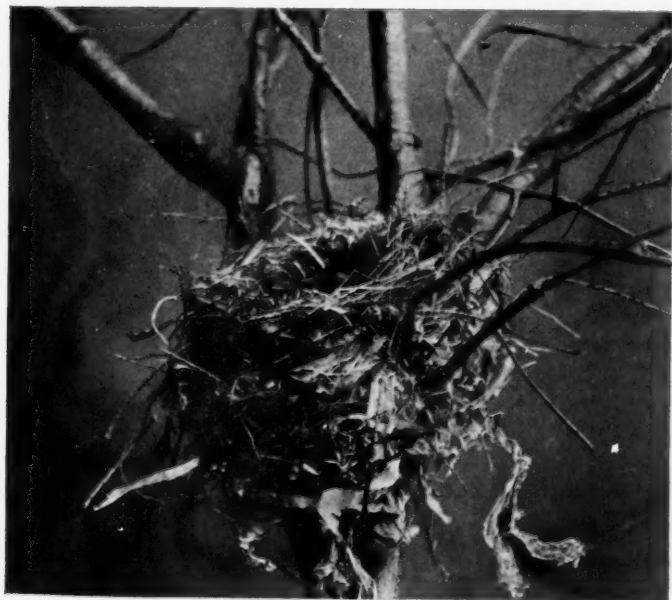
Penthestes carolinensis. CAROLINA CHICKADEE.— Fairly common on Cross Mountain up to 3300 feet; noted at High Cliff, Walden Ridge, and Lawrenceburg.

Polioptila caerulea. BLUE-GRAY GNATCATCHER.— A few observed at Briceville.

Hylocichla mustelina. WOOD THRUSH.— Observed in small numbers at Briceville, Soddy, and High Cliff.

Planesticus migratorius achrusterus. CAROLINIAN ROBIN.— One or two seen at Lawrenceburg, September 12-15.

Sialia sialis. BLUEBIRD.— Noted in small numbers at High Cliff, Cross Mountain (1000-3500 feet), Walden Ridge, and Lawrenceburg.



NESTS OF BLACK-THROATED GREEN WARBLER.





NESTS OF BLACK-THROATED GREEN WARBLER.
Young 8 days old.

1400

BIRD PHOTOGRAPHING IN THE CAROLINAS.

BY B. S. BOWDISH.

Plates XV-XVII.

WITH AN ANNOTATED LIST OF THE BIRDS OBSERVED.

Compiled by P. B. Philipp.

OUR party, consisting of Messrs. P. B. Philipp, Clinton G. Abbott and B. S. Bowdish, left New York on the morning of June 9, 1909, and reached Charleston, South Carolina, on the following morning, June 10. We went at once to the Museum and saw Professor Rea and from him learned the exact location of two heron rookeries near Charleston Harbor, which were the main object of our visit to Charleston.

We were also directed to a Captain Fairchild, who runs a forty foot gasoline boat, the 'Ethel', a model example of comfort for our purpose, and whose dusky first mate was known as 'Jawn'.

As we passed out from the dock we took several memento views of the water-front, the custom house, and a lighthouse relief ship. Further down the bay we caught snaps of historic old Fort Sumter where was fired the first gun in the Civil War, and a little further out met a torpedo boat destroyer coming in.

For miles the coast is bordered with a wide fringe of salt marsh, intersected with open water courses or channels of varying width and depth, which cut the marsh up into islands, large and small. It was through such scenes that we proceeded to the rookery. Great and Little Blue, Louisiana and Green Herons, and one Snowy Heron were seen feeding in the marsh, and we noted Royal, Common and Least Terns, Laughing Gulls, a Willet and an Oystercatcher.

As we approached Secessionville Rookery we passed the little settlement Secessionville on the opposite side of the channel. Soon we could see the Herons sitting on their nests and feeding in a strip of marsh about the edge of the island. The size of the island was estimated at two and one-half to three acres. It was grown with dense patches of bay and sparkleberry bushes and cabbage palms, interspersed with open spaces of salt grass and prickly pear, the whole bordered with a strip of salt marsh. The heron nests were scattered

thickly through the bushes at a height varying from two to fifteen feet. The ground under the nests was well above tide and perfectly dry. We estimated the colony to consist of about 300 pairs of Louisiana Herons, 200 pairs of Green Herons, 100 pairs of Little Blue Herons, 25 pairs of Black-crowned Night Herons, and possibly 50 pairs of Snowy Herons, and the nests of a fairly numerous colony of Boat-tailed Grackles were scattered among the heron nests, generally placed higher and more in the slender tips of the branches. Only one photograph (an unsatisfactory one) of one of these birds was secured. Some of the young herons had left the nests and large droves of them were scrambling through the tops of the bushes. A large proportion of the nests held young in varying stages of development. A fair number of nests still held eggs, but they were mostly well along in incubation. Plumers had shot in this colony about three weeks before our visit, and we found two piles of the remains of Snowy Herons, eight in each, from which the plumes had been torn. Notwithstanding this the herons were all surprisingly fearless and unsuspicious. Most of the young of the grackle colony were out of the nest and well developed; some nests still contained young, and in two or three of these nests were one or two eggs, and one nest contained three fresh eggs.

We returned to Charleston that evening, stopping for a few minutes at Morris Island where there was a breeding colony of some twenty-five pairs of Least Terns and a few Willets and Wilson's Plovers. The next day, June 11, was spent at the Secessionville rookery in a largely fruitless effort to secure photographs. During a considerable portion of this time Mr. Abbott remained on Morris Island, securing some very good photographs of Least Terns about their eggs. We were caught on the rookery island by low tide and with great difficulty waded the "soap flats" to the row boat that was to take us back to the 'Ethel', being obliged to leave part of our outfit and return for it about one o'clock A. M. The herons became especially active about dusk when many returned with food for the young. Some few remained active during the night but apparently the majority went to roost. Insufficient time and an error of judgment resulted in our failing to get practically any heron photographs of value.

The next day, June 12, we started on the 'Ethel' for Bulls Bay,

stopping en route to photograph nests and eggs of Least Tern and a Wilson's Plover nest. Most of the Least Terns had two eggs, a few had only one and two had three. We also stopped for a very short time at Bird Island Shoal where some fifty Brown Pelicans and one hundred Royal Terns, with a few Black Skimmers, a large number of small sandpipers and one or two Willets were congregated. It was a well patronized feeding ground but there was no sign of any nesting. At Vessel Reef, a sandspit of about one half acre, there were about 1000 Black Skimmers, 500 Brown Pelicans and 75 Royal Terns. The Pelicans were not nesting but laying had just commenced with the Terns and Skimmers. We also noted one Oystercatcher nesting-hollow with one egg, and another with two.

We reached our final destination in Bulls Bay, at Raccoon Key, about five P. M. This is an island of considerable size and some of its sand dunes are fairly high. There were a good many Wilson's Plovers nesting here and perhaps fifty pairs of Least Terns. There were also quite a few Willets but they were much harassed by minks and Fish Crows; one nest with three eggs and another with one being the only ones we found that had not been robbed. In two cases we found the remains of birds that had been caught on the nests by minks and killed, while the empty shells in the nests beside them showed where the eggs had been sucked. We found one Oystercatcher's nest with two eggs. We remained at Raccoon Key till the following afternoon, when we returned to Charleston, having secured some very good photographs of Wilson's Plover, as well as of nests and eggs. On June 14 we secured the services of young Mr. Grimble with his gasoline boat, to visit the second heron rookery, which was on an island in the salt marsh on his father's property. This trip to and from the island took up the most of two days and was unsuccessful, as apparently the only nesting birds were a few Green, two or three Louisiana, and one pair of Black-crowned Night Herons. Boat-tailed Grackles and Red-winged Blackbirds had also nested there. Two dead Snowy Herons and remains of several Little Blue Herons were found. The evening flight of herons into the rookery indicated that it was being used as a roosting place by a considerable number of birds. A Black Vulture was seen in the rookery.

We left Charleston on the evening of the 15th, for Lake Ellis, North Carolina, which we reached about noon the following day

(June 16). Camp Bryan, belonging to several wealthy sportsmen who lease the surrounding area as a game preserve, had been kindly put at our disposal by the owners, and here we found Mr. H. H. Brimley, curator of the Raleigh Museum, awaiting us. A day or two later Mr. Nichols, the son of one of the owners, joined our party. We spent the afternoon in the rain, hunting King Rails' nests, of which we found one containing ten eggs, in the short marsh grass that covered a large part of Lake Ellis. Two nests of the Least Bittern with three eggs each, and one with five young, were found in this grass, in very different sites from those of normal nests that we had seen in the north. The flock of fourteen American Egrets which regularly fed at the lake was also seen.

The 17th was a cloudy day, raining at times, and as Mr. Philipp was sick, very little was accomplished. On the 18th a trip was made to Great Lake where there was a very interesting colony of Florida Cormorants, nearly thirty scattering nests of Osprey, seventeen of the Great Blue Heron, sixteen nests of the Little Blue Heron with eggs, and several of the Black-crowned Night Heron. The Cormorant rookery was situated on the two opposite points of a bay. I made a diagram on the spot, showing the trees in which most of the nests were placed, the approximate positions of these trees and the general height and number of nests counted. Only one nest with eggs was seen; a few were empty; the majority held young in various stages of growth, mostly well advanced. It was at Great Lake that the flock of fourteen American Egrets roosted but the nesting site is not known.

June 19 was largely consumed in securing photographs of the Least Bittern at its nest, and searching for nests of the King Rail. A nest of the Florida Gallinule was found containing four eggs which were just about hatching. Probably some had previously hatched. June 20 was spent at Great Lake, and a nest of the Prothonotary Warbler was found, containing well grown young. Fish Crows had entirely destroyed the eggs in the Little Blue Heron colony. The photographic feature of June 21 was the securing of a photograph of the Florida Gallinule at her nest, thereby proving that the nest was not a King Rail's as had been previously supposed. The camera was tripped with a thread about 150 yards long, the operator being concealed at the far end. At this distance it was impossible to dis-

tinguish the identity of the bird, and development alone revealed it and established a new breeding record for North Carolina. Some photographs of the Prothonotary Warbler were also secured, and a nest of the Pied-billed Grebe with four eggs was found.

June 22 was a comparatively uneventful day, and on the 23d we started for Royal Shoals. We spent that afternoon in a heron rookery near Beaufort, where the Louisiana, Little Blue, Green, Black-crowned Night and a few Snowy Herons had evidently nested in considerable numbers. The growth was taller and the nests at greater height than at the Secessionville rookery. The young were so well developed that they were able to travel well ahead of us, over the bush tops, as we forced our way through the tangled growth. Some shooting was reported to have been done in this rookery and the remains of a few dead birds were seen.

On the following morning the Audubon patrol boat 'Dutcher', captained by Warden Jenette, came in and we started on her for Royal Shoals, reaching there late that afternoon. This low sand spit, which had been a breeding place for a colony of Royal Terns, estimated in 1908 at 7,000 birds, had been washed over in the midst of that breeding season, with great loss to the birds, and the Royal Terns had not appeared in 1909 until the night before we reached there, when the first stragglers were arriving. There were about 250 Common Terns, 200 Least Terns, 200 Black Skimmers and 100 Laughing Gulls nesting on the island, which was a very narrow fishhook-shaped formation, with small bushes, weeds and grass at the shank end, where the Laughing Gulls bred. The Skimmers' nests were also mostly in that vicinity, as well as the principal colony of Least Terns, with nests of the Common Tern interspersed and also scattered about the hook. The Skimmers were just commencing to lay, though one nest was seen with five eggs. Most of the Common Terns' nests had three eggs, some two and one, and one nest held six eggs, undoubtedly laid by two birds. A few Least Terns had hatched; most of the nests had two eggs and a few one. The Laughing Gulls had nests of two and three eggs, and Warden Jenette reported that some young had hatched and were hiding in the weeds.

We remained at Royal Shoals till about three p. m. the next day, June 25. More Royal Terns arrived and thirty-six were counted

in one flock. On this date the warden reported his count of eggs as follows: Common Tern, 248; Least Tern, 107 and 12 young birds; Black Skimmer, 60. We started for Ocracoke ahead of one of the warden's 'living gales' or 'dangerous squalls', but reached there alive and well, about four-thirty P. M.

On the following day Mr. Abbott left us, bound for New York, while the rest of the party started for Buxton on Cape Hatteras. At noon we stopped at Miller Lump where a colony of about one thousand Royal Terns were breeding. Most of them had one egg, several two, and a few young had hatched. One Gull-billed Tern was seen and the warden reported that a pair had bred. There were also three pairs of Cabot's Tern, each with a single egg, in the colony. The birds had laid their eggs but a few inches apart on the highest part of the island and the area occupied was not over twenty feet in diameter and grouped about a warning sign. After doing some photographing we went on to Davis Lumps, on one of which a colony of about one hundred Black Skimmers were congregated, perhaps preparing to breed, and about twenty-five pairs of Common Terns were nesting. The latter had a number of young, some several days old, as well as eggs. We went on to Buxton, where we were entertained over the next day at the home of Dr. Davis, and spent a quiet Sunday.

On June 28 we returned to Miller Lump and did some more photographing. It was an occasion of rare pleasure to find the Royal Terns so fearless. When we sat in plain view, and not over one hundred feet from the eggs, the birds quickly returned, and by erecting a blind of the sea-weed drift, in great mats, over a framework of sticks, we photographed the birds at a range of fifteen feet or less.

Leaving for Ocracoke we stopped at Legged Lump, which is the property of the North Carolina Audubon Society. Notwithstanding the warning sign, the birds breeding here had been robbed regularly. Some two hundred Skimmers and a few Common and Least Terns were attempting to breed. We found one nest of the Common Tern with three eggs, one with two and one with one; one nest of the Least Tern with one egg and three with two each; two nests of the Skimmer with one egg each, four with two each, three with three each. Many empty nests of the Common Tern and Skimmer were seen.



ROYAL TERNS, PAMLICO SOUND, N. C.

100
100
100
100
100



BLACK SKIMMER.



YOUNG LEAST TERNS.

1000



FLORIDA CORMORANT.



FLORIDA GALLINULE, LAKE ELLIS, N. C.

1871

On the docks at Moorehead City on June 29 we met and talked with A. T. Piner, who was one of the most active plumers in former times, and plied his trade along the Atlantic coast from Maine to Florida, killing all species of terns, the American Egret and Snowy Heron. The price he had received for terns' wings was one and one half cents a pair, and at this he had made good wages! He thought that he had himself killed twenty thousand birds, besides those killed by his assistants. He and one assistant would each skin one hundred Least Terns in twenty-four hours. When they found a colony of the lovely little Least Terns they were able to kill every adult bird, because the parental instinct brought the last one back to its nesting site. And then came the closing chapter in his gruesome tale. Many young already hatched at the time of the slaughter were left parentless. Many eggs, of course, never hatched, but others that were approaching the completion of incubation hatched in the sun, and the tiny chicks joined the ranks of their older brothers. This man had seen the tiny chicks gathered on the beach so thickly that they looked like drift brought up by the tide, huddled at the water's edge, dipping their little beaks in the salt wavelets in a vain endeavor to assuage the terrible pangs that dead parents could never again provide against. Those who have not visited these semitropical islets, whose flat, sandy surfaces lie just above the level of the lapping waves, can have no conception of what it is to feel the awful pangs of hunger and thirst, where water, sand and air reflect back again and again the all-pervading, burning rays of the sun. What a satisfaction to feel that this unspeakably brutal trade has been almost eliminated, as far as our own coasts are concerned, by the work so earnestly commenced by the Bird Protection Committee of the American Ornithologists' Union, and so ably carried on by the Audubon Societies.

ANNOTATED LIST OF BIRDS OBSERVED.

Compiled by P. B. Philipp.

1. **Podilymbus podiceps.** PIED-BILLED GREBE.—Abundant at Ellis Lake, N. C., where it was seen daily June 16–20. Breeds in the reedy marshes surrounding the lake; three nests were found June 16 and 20, one with 1 egg, one with 5 fresh eggs, and one with 4 fresh eggs; on June 20, one newly hatched chick was captured after a hard chase. The nests were all in patches of reeds where there was good diving water.

Mr. H. H. Brimley, of the North Carolina Museum, informs me that this nesting is the first record for the State. The birds have not heretofore been found nesting at Lake Ellis.

2. **Larus atricilla.** LAUGHING GULL; BLACK HEAD; SUMMER GULL.—A fair sized breeding colony of this gull was observed on Royal Shoal, Pamlico Sound, N. C., comprising some two hundred and fifty birds. The colony was visited on June 24, and at this date many of the nests were empty, the young having hatched; many other nests had 2 and 3 eggs, all advanced in incubation. The nests on the shoal were all carefully hidden in the rank beach grass and low bushes, and were found by following paths made by the birds. This gull was not noted breeding elsewhere on the trip.

3. **Gelochelidon nilotica.** GULL-BILLED TERN.—Seen only in Pamlico Sound, N. C., and there rare. A single tern of this species was seen June 25, in a large colony of Common Terns (*Sterna hirundo*), on Royal Shoal. On Miller Lump, off Buxton, further up the sound, a pair were seen June 26, which the warden told me had nested the previous week, the young having hatched. These could not be found.

4. **Sterna maxima.** ROYAL TERN.—Common in suitable localities along the coasts and among the shallow bays of North and South Carolina. Four breeding colonies were found. The first was situated on Vessel Reef, a low sand key in Bulls Bay, S. C., visited on June 12. About 75 birds were seen there and nesting had just begun, 3 fresh eggs being found. The second colony was on Royal Shoal, Pamlico Sound, N. C. Here, instead of the enormous numbers of the preceding season, estimated at some 7,000 birds, only fifty were found. On June 24 one fresh egg was noted. The third and largest colony was found on June 26, on Miller Lump, a small low sand bar in Pamlico Sound, lying in a broad expanse of very shallow water. This colony comprised 1,000 adult birds; the nesting was advanced. Some 258 good eggs were counted, usually one egg to a set, though a few doubles were found; there were also many young, some of which were able to run about. All the eggs were advanced in incubation. The fourth breeding colony visited was on Davis Lump, a small sand bar near Miller Lump. Here about 60 pairs of birds were breeding. Thirty-two eggs were counted, for the most part advanced in incubation; half a dozen newly hatched young were also seen.

Owing to the protection afforded by the North Carolina Audubon Society, the colonies in Pamlico Sound were in fair condition and the birds very tame, allowing a very near approach.

5. *Sterna sandvicensis acufflava*. CABOT'S TERN.—Rare in Pamlico Sound, N. C., the only locality in which it was seen. On June 26, six birds of this tropical species were found on Miller Lump, off Buxton, in Pamlico Sound. Here also three nesting hollows were found, each containing a single egg advanced in incubation. The birds were breeding with a large colony of Royal Terns (*Sterna maxima*).

Mr. T. G. Pearson tells me that in 1908 about 75 pairs of this tern bred on Royal Shoal.

6. *Sterna hirundo*. COMMON TERN; WILSON'S TERN; BIG STRIKER.—Very abundant in Pamlico Sound, N. C., where it was found breeding. Rare along the beaches and keys along the South Carolina coast near Charleston, and at Bulls Bay, S. C.; not found breeding there.

The largest colony visited was on Royal Shoal, where 248 eggs were counted on June 24, in a small area on the point of the shoal. The eggs were 2 or 3 in a nest; one nest seen having 6, probably laid by two birds. Other good sized colonies were found on Davis Lump June 26 (20 pairs); on Legged Lump June 28 (12 pairs).

Most of the eggs taken were advanced in incubation and many young had already appeared.

7. *Sterna antillarum*. LEAST TERN; LITTLE STRIKER.—Fairly common on the South Carolina coast. Seen at Morris Island, Charleston Harbor; at Raccoon Key, Bulls Bay, S. C. Common in Pamlico Sound, N. C.; seen on all the suitable lumps and keys. Breeds in each of these localities.

Four fair sized breeding colonies were visited. The first was on Morris Island in Charleston Harbor, where 50 pairs of birds were seen, and thirty nests with eggs, which on June 10 were fresh; a second colony of some 100 birds was found on June 12 on the south end of Raccoon Key, and ten or a dozen nests with fresh eggs. The third and largest colony was on Royal Shoal, Pamlico Sound, N. C., where some 200 birds were breeding. 107 eggs and 12 young being counted June 24, 25; a small colony of 20 pairs was found June 25 on Davis Lump, and 37 eggs counted; the eggs taken from these Pamlico Sound colonies were incubated.

Several other scattering pairs were seen on the small keys and banks in Pamlico Sound, and the birds were seen daily during our visit there. These colonies have greatly increased during the last few years, due to the activities of the North Carolina Audubon Society, which has provided a warden to watch them.

8. *Hydrochelidon nigra surinamensis*. BLACK TERN.—Rare and accidental in Pamlico Sound, where two individuals were seen, one on Royal Shoal June 25, and the other on Miller Lump off Buxton on the same date. I could not find that it breeds.

9. *Rynchops nigra*. BLACK SKIMMER.—Abundant in suitable locali-

ties along the coasts and shallow bays of both North and South Carolina, breeding where found. This bird was seen daily June 10-15 around Bulls Bay, S. C., and June 24-29 in Pamlico Sound, N. C. The birds are late breeders. In the largest colony found, of some 1,000 birds, on Vessel Reef, Bulls Bay, the birds had just started laying, one and two eggs being laid; on Royal Shoal June 24, the nests had 3 or 4 eggs, and one was found with 5 slightly incubated. No young were seen in any colony visited.

10. *Phalacrocorax auritus floridanus*. FLORIDA CORMORANT.—A large colony of a cormorant ascribed to this species was found breeding at Great Lake, Jones County, N. C. The birds were nesting in a group of yellow pines on the edge of the lake, the nests being situated from 15 to 75 feet from the ground. On the date visited, June 18, all the nests but one had young in various stages of growth, from newly hatched to almost full-fledged. One nest contained 3 eggs advanced in incubation. One hundred and twenty-three used nests were found. Mr. Pearson tells me that this colony, which has been at the lake for some years, is slowly decreasing.

11. *Pelecanus occidentalis*. BROWN PELICAN.—Not uncommon a few miles north of Charleston, S. C. (Bulls Bay), where on June 12 over five hundred birds were seen. Said to breed near Bulls Bay, but we could not find the breeding place.

Casual in Pamlico Sound, N. C. On Legged Lump, in the sound, on June 28, four birds were seen roosting on a sand spit. Not known to breed.

12. *Anas boschas*. MALLARD.—Very rare at Lake Ellis, N. C., in summer. One was seen by Mr. Abbott at the lake June 18. The remains of a duck of this species, partially eaten by minks, was found in the marsh around Ellis Lake; probably a wounded bird unable to leave in the spring.

13. *Aix sponsa*. WOOD DUCK.—Abundant at Ellis Lake, N. C., where it breeds in the big gum timber around the lake. Seen daily, singly or in pairs; on one occasion a flock of six was noted. Common also on the Hatteras Banks at Buxton, where it breeds.

14. *Ixobrychus exilis*. LEAST BITTERN.—Abundant at Ellis Lake, N. C., where it breeds in the thick growth of wild rice and rushes around the lake. Four nests were found, June 16-20, one of which had five well grown young, and two others eggs advanced in incubation; one nest had one fresh egg.

15. *Ardea herodias*. GREAT BLUE HERON.—Occurs abundantly in the marshes of the Sea Islands, S. C., where seen June 10, feeding in the salt creeks and ponds. Not found breeding there.

Abundant at Great Lake, Jones Co., N. C., where it breeds. Seen June 18 and 20. At this date all the young had hatched and some were as large as the old birds. In one cypress tree at the lake, not twenty feet high, were eleven used nests. In another cypress, two nests with grown young were noted and four other scattering nests.

16. *Herodias egretta*. AMERICAN EGRET; LONG WHITE.—A small

flock of this heron was seen daily June 16-20 at Ellis Lake, N. C., feeding in the marshes around the lake. Not known to breed, although reported by Mr. Brimley as seen during the probable breeding season.

17. ***Egretta candidissima***. SNOWY EGRET.—About 50 pairs of this egret were found in a large heron rookery visited June 10 at Secessionville, S. C. The birds were breeding in company with other herons, and had succeeded in raising many young, which were scrambling about in the bay bushes. Seven nests with eggs were found, which were advanced in incubation. This rookery had been raided by plumers, and several piles of egret bodies, denuded of plumes, were found among the bushes.

18. ***Hydranassa tricolor ruficollis***. LOUISIANA HERON.—This heron was breeding in large numbers at the rookery at Secessionville, S. C., the number being estimated at 300 pairs. On June 11, there were both young and eggs, many of the young being fully fledged. The nests were in low bay bushes, from 8 to 15 feet from the ground.

19. ***Florida cærulea***. LITTLE BLUE HERON.—Two nesting colonies were found. One, at Secessionville, S. C., where about 100 pairs were breeding in bay bushes with other herons, was visited June 10. The nests held both eggs and young, many of the latter being able to fly, and all the eggs were advanced in incubation. The nests were in low bay bushes, 8 to 10 feet from the ground. The other colony was situated at Great Lake where sixteen nests containing fresh eggs were found June 18, in some low bushes around the edge of the lake. These eggs were later destroyed by Fish Crows.

20. ***Butorides virescens***. LITTLE GREEN HERON.—Very abundant in a heron rookery visited June 10 and 11 at Secessionville, S. C., where it was breeding with several other larger herons. Here were found about 200 pairs, which for the most part had young in various stages of growth; a few eggs were found advanced in incubation. Another colony was found on Grimble Island, June 14, where about 50 occupied nests were seen.

21. ***Nycticorax nycticorax nævius***. BLACK-CROWNED NIGHT HERON.—About 30 pairs were found in the heron rookery at Secessionville, S. C., June 10 and 11, where we noted eggs and young in various stages of growth, many of the latter having left the nests. At Great Lake, Jones County, N. C., two nests with well grown young were found June 18. Nowhere as common as the other herons.

22. ***Rallus elegans***. KING RAIL.—Common at Ellis Lake, N. C., where it breeds in the wet, reedy marshes around the lake. The bird was seen or heard daily June 16-20. A nest found June 16 contained 10 eggs advanced in incubation. This nest was placed in a thick patch of rushes in a wet part of the marsh, and the rushes were arched over the eggs, a typical situation.

23. ***Rallus crepitans***. CLAPPER RAIL.—Very abundant in the extensive salt marshes around Charleston Harbor and Bulls Bay, S. C., where it was seen or heard daily June 10-15. One nest, with four fresh eggs, was taken June 14 on St. James Island, S. C. Several empty nests, apparently used, were found June 12 in the marsh behind Raccoon Key, Bulls Bay, S. C.

24. **Gallinula galeata.** FLORIDA GALLINULE.—Rare and unusual at Lake Ellis, N. C. One nest was found in a wet part of the marsh at the lake on June 21, which contained four eggs on the point of hatching. No other nests were found, nor other birds seen. Mr. H. H. Brimley tells me that this nesting record is a new one for the State.

25. **Tringa canutus.** KNOT; ROBIN SNIPE; FOOL-BIRD.—Very common on the beaches and keys of Bulls Bay, S. C., where several flocks were seen June 12 and 13, particularly on Vessel Reef, Bird Island Shoal, and Raccoon Key.

26. **Pisobia minutilla.** LEAST SANDPIPER.

27. **Ereunetes pusillus.** SEMIPALMATED SANDPIPER.

Several flocks of small sandpipers, which probably included both these species, were seen on Bird Island Shoal, Bulls Bay, S. C., June 12, and on Legged Lump in Pamlico Sound on June 28. None were collected.

28. **Catoptrophorus semipalmata.** WILLET.—Very common on Raccoon Key, Bulls Bay, and on Morris and St. James Islands, S. C., where the birds were seen June 10–15.

The largest colony found was on Raccoon Key, where nests were found. The Willet builds quite a nest of bits of drift and dried seaweed, usually on the ground in a bunch of the black grass. Two nests found were in such position; one contained one egg and the other three, all fresh. The birds here had been badly persecuted by Fish Crows and minks; broken and sucked eggs were found everywhere, and two nests were found in which the skeleton of the bird was lying on sucked eggs, the work of minks.

The Willet is the most striking bird of the region, and is the noisiest. One cannot approach their haunts without one or more coming to greet him with shrill cries. Flying around close to one, they scream and shriek, hovering with trembling wings and open beak. They seem to make as much noise when away from their nest as when near it, and give no indication of its location. A beautiful species, characteristic of the southern marshes and beaches.

29. **Numenius longirostris.** LONG-BILLED CURLEW; JACK CURLEW.—A flock of six was seen June 12 on Bird Island Shoal, Bulls Bay, S. C., feeding with other shore birds.

There is a persistent idea among the fishermen and baymen of the region that this species breeds here; we did not find a nest, however, and did not hear of any nest ever being found.

30. **Ochthodromus wilsonius.** WILSON'S PLOVER.—Very common among the islands and along the sandy beaches off the South Carolina coast, being especially abundant on Raccoon Key, Bulls Bay, S. C. This plover was seen daily June 10–15. Nests were found June 10–12 on Morris Island and Raccoon Key. Of six nests, five had three eggs each and the other two, all fresh. The eggs are laid among the shells in shallow hollows, and are very hard to find. The birds fool one repeatedly, squatting down among the shells as if on eggs when far from the nests, and seldom disclose their location.

31. *Arenaria morinella*. TURNSTONE.—Three birds of this species were seen on Bird Island Shoal, Bulls Bay, S. C., on June 12. The birds were feeding in company with some other shore birds, and were very tame, allowing a close approach.

32. *Hæmatopus palliatus*. OYSTER-CATCHER; SEA CROW.—Common in suitable locations along the North and South Carolina coasts, breeding where found. These birds were seen all around Charleston Harbor and Bulls Bay, S. C., June 10–15, and at Royal Shoal, Pamlico Sound, N. C. Nests were found June 12 on Vessel Reef, Bulls Bay, one with two eggs and one with one, fresh; another nest was found on Raccoon Key, Bulls Bay, with two eggs slightly incubated.

33. *Zenaidura macroura carolinensis*. MOURNING DOVE.—Common on St. James Island, S. C., where several were seen June 15. One was seen in the oak scrub near Beaufort, N. C. No nests were found.

34. *Chæmepolia passerina terrestris*. GROUND DOVE.—One pair was seen by Mr. Abbott on St. James Island, June 15.

35. *Cathartes aura septentrionalis*. TURKEY VULTURE; TURKEY BUZZARD.—Very abundant around Charleston, S. C., and all through the Sea Islands, around Lake Ellis, and on the Hatteras Banks. Seen almost daily June 10–28. Several were noted around the heron rookery at Secessionville, S. C. Common in the Market Place at Charleston.

36. *Catharista urubu*. BLACK VULTURE; CARRION CROW.—Very common around the Sea Islands, and in and about the city of Charleston, S. C., where they may be seen daily in the Market Place. A large flock of some 25 birds was seen June 15 on St. James Island, S. C., where there was a roost.

Casual at Ellis Lake, N. C., one bird being noted there June 18.

37. *Elanoides forficatus*. SWALLOW-TAILED KITE.—Rare but regular at Lake Ellis, N. C., where on June 18 a male of this species was noted. Mr. H. H. Brimley tells me that one or more of these birds are seen each summer at the lake. I could not find that it bred there.

38. *Buteo lineatus*. RED-SHOULDERED HAWK.—Common at Lake Ellis and Great Lake, N. C., where it was seen or heard daily June 16–20. One was seen at Buxton on the Hatteras Banks June 27. Mr. H. H. Brimley tells me they breed around Lake Ellis and Havelock, N. C.

39. *Falco sparverius*. SPARROW HAWK.—One seen by Mr. Abbott near Havelock Station, N. C., June 26.

40. *Pandion haliaëtus carolinensis*. OSPREY; FISH HAWK.—Abundant at Lake Ellis and at Great Lake, N. C., where there is a large breeding colony. On June 20, thirty occupied nests were counted around Great Lake, which had young in them of various stages of growth, many being ready to fly. One nest held three young, but two was the usual number. Some of the nests were huge structures; all were in cypress trees, usually out in the lake itself, and from fifteen to fifty feet above the water.

41. *Strix varia*. BARRED OWL.—Not a common resident at Lake Ellis. The hoot of the owl was heard near camp on June 17 and 20. Said to breed in the heavy sweet gum timber around Great Lake.

42. *Otus asio*. SCREECH OWL.— Heard nightly around camp at Ellis Lake, June 16–20, a bird having a roosting place in a sweet gum directly over the camp. Said to breed.

43. *Bubo virginianus*. GREAT HORNED OWL.— Not common around Lake Ellis, N. C. One was seen by Mr. Abbott June 18, in the heavy timber around Great Lake, N. C. Not found breeding there. "Seen more commonly in the colder months" (Brimley).

44. *Coccyzus americanus*. YELLOW-BILLED CUCKOO.— Common at Lake Ellis, N. C. Heard and seen daily June 16–20, in the sweet gum thickets near camp. No nest was found, "but the species breeds" (Brimley).

45. *Ceryle alcyon*. BELTED KINGFISHER.— One bird seen June 16 at Newberne, N. C. "Common in eastern North Carolina, breeding in suitable localities" (Brimley).

46. *Dryobates villosus*. HAIRY WOODPECKER.— Not common at Lake Ellis, N. C. This species was recorded by Mr. Abbott as occurring in the heavy timber between Ellis and Great Lakes, where it was seen June 18. Another was seen feeding on a dead pine stump near Havelock, N. C., June 16.

47. *Dryobates pubescens*. SOUTHERN DOWNY WOODPECKER.— Common at Lake Ellis, N. C. Recorded by Mr. Abbott June 17 and 18 near camp at the lake, and in the woods at Great Lake. No nests were found, but Mr. H. H. Brimley tells me it is a common nesting bird.

48. *Phloeotomus pileatus abieticola*. NORTHERN PILEATED WOODPECKER.— Rare around Lake Ellis, N. C. A bird ascribed to this species was seen by Mr. Abbott in the large sweet gum timber between Lake Ellis and Great Lake on June 18.

49. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.— Not uncommon at Lake Ellis, N. C., "where it breeds" (Brimley). Mr. Abbott saw this species at camp on Lake Ellis June 17, and in the woods at Great Lake June 18.

50. *Antrostomus carolinensis*. CHUCK-WILL'S-WIDOW.— Rare around Lake Ellis, N. C. Mr. Bowdish records an individual which he heard calling in a bit of timber near the Havelock Station, N. C.

51. *Chordeiles virginianus*. NIGHT HAWK; BULL BAT.— Not uncommon among the Sea Islands, S. C. A pair of this species was seen June 12 on Raccoon Key, Bulls Bay, and another on St. James Island, S. C., June 15. They breed, but we found no nests. A single bird was seen by Mr. Bowdish at Havelock Station, N. C., June 18.

52. *Archilochus colubris*. RUBY-THROATED HUMMINGBIRD.— One seen by Mr. Abbott on June 20, on the road between Havelock and Lake Ellis, N. C.

53. *Chaetura pelagica*. CHIMNEY SWIFT.— Common around Charleston, S. C., and at Ellis Lake, N. C.; at the latter place a nest with four eggs was taken June 17, from an old chimney flue in the roof of our camp. In the Great Lake woods several birds were seen diving into a huge dead gum tree.

54. **Tyrannus tyrannus.** KINGBIRD; BEEBIRD.—Common on St. James Island, S. C., and at Havelock and Ellis Lake, N. C., breeding abundantly in both localities. Nests were found at St. James Island June 14, and at Havelock June 17 and 18, with fresh eggs.

55. **Myiarchus crinitus.** CRESTED FLYCATCHER.—One seen by Mr. Abbott at Lake Ellis, June 18.

56. **Myiochanes virens.** WOOD PEWEE.—Common around Havelock and at Lake Ellis, where it breeds. A nest was found at Havelock 60 feet up in a huge yellow pine, on which the bird was sitting on June 16. Other birds were noted by Mr. Abbott at Lake Ellis, June 17 and 20.

57. **Empidonax virescens.** ACADIAN FLYCATCHER.—One recorded by Mr. Abbott as seen along the brushy bank of a canal at Ellis Lake, N. C., on June 18.

58. **Cyanocitta cristata.** BLUE JAY.—Common at Ellis Lake, N. C., where it was seen daily June 16–20, especially in the pine timber surrounding the lake.

59. **Corvus brachyrhynchos.** AMERICAN CROW.—Not uncommon in the heavy pine and sweet gum timber around Ellis Lake. June 19 and 20 several were heard by Mr. Abbott.

60. **Corvus ossifragus.** FISH CROW.—Abundant around Charleston, S. C., and on the neighboring beaches and marshes; at Lake Ellis, and at and near Beaufort, N. C., and on the Hatteras Banks in Pamlico Sound, this bird was seen almost daily during the trip, June 10–28. Especially common at Bulls Bay, S. C., and at Great Lake, N. C. They breed where found, but the young at this date were on the wing.

This bird is very destructive to the various colony nesting birds. In one instance, noted at Great Lake, all the eggs in a Little Blue Heron colony of some sixteen nests had been destroyed. At Bulls Bay many Willet's eggs were found sucked clean, and some eggs of the Least Tern and Wilson's Plover.

61. **Agelaius phoeniceus.** RED-WINGED BLACKBIRD.—Abundant at St. James Island, S. C., and at Ellis Lake, N. C., breeding in both localities. Nests were found almost daily at Ellis Lake, June 16–20, with eggs or young. One pair was seen at Buxton on the Hatteras Banks June 27.

62. **Sturnella magna.** MEADOWLARK.—Not uncommon in the open fields between Havelock and Lake Ellis, N. C. Seen by Mr. Abbott June 18.

63. **Icterus spurius.** ORCHARD ORIOLE.—Common at Ellis Lake, N. C. Particularly noted June 17, when a nest was found, and on June 19 around camp at the lake. One bird seen in an orchard on St. James Island, June 15.

64. **Quiscalus quiscula.** PURPLE GRACKLE.—Noted by Mr. Abbott June 19, at Lake Ellis, N. C.

65. **Megaquiscalus major.** BOAT-TAILED GRACKLE.—Very abundant among the Sea Islands, S. C., where it breeds in large colonies. A colony found on a small island in the salt marsh near Secessionville, S. C., comprised hundreds of pairs. At the time it was visited, June 10 and 11,

many young were on the wing and nearly all the eggs had hatched. Two or three nests were found, with one or two fresh eggs, and one nest with three fresh eggs.

66. *Spizella pusilla*. FIELD SPARROW.—Common at Ellis Lake, N. C., where it was seen daily June 16–20.

67. *Pipilo erythrophthalmus*. TOWHEE; CHEWINK; GROUND ROBIN.—Common among the Sea Islands, S. C., and at Lake Ellis, N. C. Particularly noted June 15 on St. James Island, where a pair with a brood of young were seen. Seen daily among the blackberry patches around camp at Ellis Lake, June 16 to 20.

68. *Cardinalis cardinalis*. CARDINAL.—Common at the Sea Islands, S. C.; at Ellis Lake, and on the Hatteras Banks, N. C. On June 15, a nest with three partially grown young was found on St. James Island. Seen or heard daily at Lake Ellis, June 16–20, and on June 27 at Buxton, N. C.

69. *Passerina cyanea*. INDIGO BUNTING.—Common at Ellis Lake, N. C., where it was seen daily in the blackberry and cat-brier thickets near camp, June 16–20. No nests were found, but Mr. H. H. Brimley tells me that it breeds commonly.

70. *Passerina ciris*. NONPAREIL.—Very common on St. James Island, S. C., where on June 15 three singing males were noted. No nests were found, though Mr. Grimble, who owns the island, tells me that they are common breeders there.

71. *Progne subis*. PURPLE MARTIN.—Abundant in and around Charleston, S. C., and at Newberne and at Lake Ellis, N. C. Seen daily June 10–20, and particularly noted on June 17 at Newberne, where a large colony was nesting; many of the birds had well grown young. A typical bird of the South, seen everywhere; scarcely a house is without its little martin house, and all are occupied by breeding birds.

72. *Riparia riparia*. BANK SWALLOW.—Uncommon and unusual during the summer in the Sea Islands, S. C. Two were seen by Mr. Abbott on St. James Island, June 15.

73. *Lanius ludovicianus*. LOGGERHEAD SHRIKE; BUTCHER BIRD.—Not common among the Sea Islands, S. C. On June 15, a nest was found on St. James Island, containing five eggs.

74. *Vireosylva olivacea*. RED-EYED VIREO.—Not common at Ellis Lake, N. C. One was seen by Mr. Abbott June 17. Several others were heard singing in the gum trees around the camp.

75. *Vireosylva gilva*. WARBLING VIREO.—Fairly common at Lake Ellis, N. C., where it was seen and heard daily in the small groves of sweet gums around the camp, June 16–20.

76. *Vireo griseus*. WHITE-EYED VIREO.—Not common at Ellis Lake, N. C. Only one bird was seen, recorded by Mr. Abbott June 18 at camp.

77. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Not uncommon at Ellis Lake, N. C. While only one bird was seen (recorded by Mr. Bowdish), Mr. Brimley tells me that it breeds sparingly in the woods around the lake.

78. *Protonotaria citrea*. PROTHONOTARY WARBLER.—Fairly common at Great Lake, Jones Co., N. C., frequenting old cypress stumps draped with moss, which afford good feeding and nesting places. On both visits to the lake, June 18 and 20, several were seen, and on June 20 a nest was found in a rotten cypress stump, standing out in the lake; the nest was placed in a deep hollow formed by the breaking off of a limb. The nest contained two fully fledged young, which attempted to leave the nest when disturbed. At the dates seen the male birds were in full song.

79. *Helinaia swainsoni*. SWAINSON'S WARBLER.—Rare around Ellis Lake, N. C. I am able to add a breeding record of this rare warbler from eastern North Carolina. On June 18, a pair of these warblers feeding large young were seen in the low undergrowth of the heavy gum timber between Great Lake and Ellis Lake. These young birds must have been hatched in the near vicinity of the lake, as they were unable to fly. Along the edge of Ellis Lake and along Great Lake, are several large patches of tall canes, making a fine breeding place. An extensive search in these canes would perhaps have revealed more of these warblers, as others were heard singing by Mr. Bowdish and Mr. Abbott.

80. *Compsothlypis americana*. PARULA WARBLER.—Very common around Lake Ellis, N. C., where it was seen daily June 16–20, in the moss-draped gum trees near the camp. No nests were found, but Mr. H. H. Brimley tells me it is an abundant breeder.

81. *Dendroica dominica*. YELLOW-THROATED WARBLER.—Very common in the pine woods at Lake Ellis, N. C., where it was seen daily June 16–20. On June 16 a pair with a brood of young were seen by Mr. Abbott. They are early breeders, and no nests were found. One male was taken June 19.

82. *Dendroica vigosii*. PINE WARBLER.—Uncommon at Ellis Lake, N. C. Only one bird was seen, June 17, near camp.

83. *Dendroica discolor*. PRAIRIE WARBLER.—Seen only in the oak scrub near Beaufort, N. C., where on June 23 a female was seen feeding a full grown young one. Mr. H. H. Brimley states that they are common in the locality.

84. *Seiurus aurocapillus*. OVENBIRD.—Uncommon at Lake Ellis. A bird was seen on the road to Havelock June 16, singing.

85. *Geothlypis trichas*. MARYLAND YELLOWTHROAT.—Common among the Sea Islands and on Raccoon Key, Bulls Bay, S. C., where it was seen June 12–15. Common at Havelock and Lake Ellis, being noted June 18.

86. *Wilsonia mitrata*. HOODED WARBLER.—Apparently not common in eastern North Carolina, at least in the localities visited by us. At Ellis Lake one nest was found June 20, containing three eggs ready to hatch. A male of this species was seen in a wet place in the scrub oak near Beaufort, N. C., but no nests were found there.

87. *Mimus polyglottos*. MOCKINGBIRD.—Very common around Charleston, S. C., on the Sea Islands, at Beaufort, and at Lake Ellis. Nests were found June 15, with three and four eggs; incubation advanced.

88. *Dumetella carolinensis*. CATBIRD.—Common at Lake Ellis, N. C. Seen daily June 16 to 20, on which latter date a nest and eggs was found by Mr. Abbott. Seen June 27 at Buxton, on the Hatteras Banks.

89. *Toxostoma rufum*. BROWN THRASHER.—Common at St. James Island, S. C., and at Ellis Lake, N. C., being seen in the thickets near camp June 18 and 19. A newly built nest was found on St. James Island June 15, which had not been laid in.

90. *Thryothorus ludovicianus*. CAROLINA WREN.—Common in suitable localities in the Sea Islands and at Lake Ellis, N. C., breeding in both places. Birds were seen June 15 on St. James Island, and daily June 16–20 around our camp at Lake Ellis. Here a freshly constructed nest was found June 19.

91. *Telmatodytes palustris*. LONG-BILLED MARSH WREN.—A marsh wren was very common in the marshes around Bulls Bay, S. C., and the rookeries on Secessionville and St. James Island. Seen and heard June 10, 11 and 15. None was collected, and the form is doubtful. No nests were found and no young seen.

92. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.—Reported as a common breeding bird around Lake Ellis, N. C., by Mr. H. H. Brimley. Only one was seen during our visit, being recorded by Mr. Abbott on June 18 near camp.

93. *Sitta pusilla*. BROWN-HEADED NUTHATCH.—Seen only in the oak scrub on the outskirts of Beaufort, N. C. Here one was seen June 23 by Messrs. Abbott and Bowdish, feeding on a dead pine stump.

94. *Baeolophus bicolor*. TUFTED TITMOUSE.—One was seen by Mr. Abbott in the woods around Lake Ellis, N. C., June 18. Several others were heard calling in the low wet timber between Lake Ellis and Great Lake on June 18 and 20. No nests or young were found or seen.

95. *Penthestes carolinensis*. CAROLINA CHICKADEE.—Seen June 18 and subsequently, by Mr. Abbott, at and around Ellis Lake, N. C. Not common.

96. *Hylocichla mustelina*. WOOD THRUSH.—“Common and breeds at both Great Lake and Ellis Lake, N. C.” (Brimley). One seen and several others heard singing in the dark, heavy timber around Great Lake, June 18 and 20.

97. *Sialia sialis*. BLUEBIRD.—Abundant and breeds at Ellis Lake, N. C. (Brimley). One was seen June 18 by Mr. Abbott near our camp at the lake.

98. *Colinus virginianus*. QUAIL; BOBWHITE.—Common on St. James Island, S. C., where a brood of young was found on June 15 in a grass-grown orchard near the plantation house. Common and breeds at and around Havelock and Ellis Lake, N. C. Seen and heard daily June 16–20.

99. *Passer domesticus*. ENGLISH SPARROW.—Seen on St. James Island, S. C., on June 15, around the plantation house. Not seen at Havelock or Ellis Lake, N. C., which appear to be among the few places it has not yet reached.

RESURRECTION OF THE RED-LEGGED BLACK DUCK.

BY WILLIAM BREWSTER.

As Dr. Dwight saw fit to remove the button from his foil before attacking the Red-legged Black Duck and me, its devoted champion, in 'The Auk' for October, 1909, I feel free to defend both the bird and myself with a similarly naked weapon. If by so doing I am fortunate enough to prick my formidable adversary here and there between the joints of his coat of mail he will remember that "faithful are the wounds of a friend" and perhaps will value them accordingly. He has indulged in no little keen but perfectly good-natured fun and satire at my expense, and at that of some of my ornithological beliefs. I shall endeavor to repay him, as best I may, in his own coin, with perhaps some accrued interest added. But first I would have it distinctly understood, both by him and by every one else, that nothing in what I am about to say is intended to express, or even to imply, the least doubt of the sincerity of any of his statements or the slightest disrespect for his scientific opinions.

The article just referred to is entitled "The Singular Case of the Black Duck of North America." This is dealt with by Dr. Dwight in a style so terse and masterful as to recall Julius Cæsar's laconic but all-embracing message, *veni, vidi, vici*. The matter is finally disposed of in the following decisive and uncompromising terms:—

"The evidence shows that all young birds, both in Canada and along the Atlantic Coast of the United States, have brownish legs, while breeding adults from the same localities have red ones. Under these circumstances the 'Red-legged Black Duck' as a subspecies does not appear to have a leg left to stand on—not even a red one. . . . Now at last after much expenditure of energy the Black Duck (*Anas rubripes*) remains an undivided species ranging over eastern North America."

That the "expenditure of energy" here mentioned has been largely on my part and not at all on that of the Black Duck is indicated by a preceding passage in which reference is made to two of my articles. Dr. Dwight advises his readers to consult them but does not himself directly discuss any of the facts and evidence they

contain. Apparently he thought that this would be a needless waste of more "energy," feeling assured, no doubt, that the weight of his own evidence and opinion would be considered sufficient to dispose of mine. Although betraying no uncertainty on this point he is evidently undecided as to whether I should be graciously pardoned or severely rebuked, for having promulgated ornithological heresy. At first he inclines towards the former course, pointing out that up to the time when his own article appeared some facts had "been missing and others misinterpreted." In another connection he pays me a graceful if qualified compliment by asking: "If an ornithologist of Mr. Brewster's ability can go astray in his conclusions what may not the rest of us do?" In still another he is generous enough to concede to "how easy it was to take the wrong path." But in the end a stern sense of duty prevails over consideration of mercy and friendship, prompting him to say unflinchingly that "the episode should be a warning object lesson for all describers to take to heart." Thus, like some poor crow, shot and hung up in a cornfield to keep others of his wanton tribe from molesting the precious grain, am I singled out and conspicuously branded to serve as a wholesome example to the ever increasing horde of reckless describers. If this fate seems somewhat hard, however well-deserved, I may at least console myself by the reflection that the remainder of my life is in a way provided for and not likely to be passed wholly in vain.

But is Dr. Dwight really justified in claiming so confidently that he has proved his contention and disproved mine? Would it not have been wiser, and also more nearly in accord with accepted usage, had he contented himself with presenting his evidence and formulating his conclusions without assuming the right to decide the case irrevocably and to publicly reprimand me, however temperately and considerately, for having taken a view of it differing from his own? Statements as positive and unqualified as some that he has made should certainly be backed by evidence sufficiently strong and convincing to amount to absolute and complete proof; otherwise they are not conclusive but, to a greater or less degree — according to the value and definiteness of the evidence — expression of mere personal opinion.

After citing the characters which I had ascribed to the Red-legged

Black Duck — giving them, however, in his own terms and in nearly inverse order, and omitting altogether one which I had placed almost at the head of the list and to which I continue to attach much importance — Dr. Dwight presents his own evidence with which I will now proceed to deal as briefly as possible. In the first place he says that by skinning and dissecting “fully fifty specimens representing many localities, north and south, besides examining dozens of others shot by friends or found hanging in the markets” he has satisfied himself that the differences which I have considered of subspecific significance “are exactly the ones that distinguish old birds from young whether they occur in the United States or in Canada.” “A series selected from many fresh specimens sent me [him] from Long Island, New York, shows that the Black Duck, like many of the other ducks, slowly passes from the juvenal into the first winter plumage, a change in the color of the feet and bill taking place at the same time. The feet of grown young birds, at first olive brown, become gradually reddened, and finally in the spring they are of nearly as bright a red as that of the adults, while the dusky bill brightens to greenish and then to yellow-green or yellow.... Once the adult colors of the soft parts are attained they are never lost,” the bill of the adult being “at all seasons of the year a bright greenish yellow and the feet a coral red, these colors dulling only a trifle after the breeding season.” While some of the young resemble adults, in respect to the color of the feet and bill, “as early as January” others “are still dull in April,” and “a very few laggards in vitality seem to remain immature during their first year.” Immediately following these positive statements and intended, apparently, to show on precisely what grounds they were based — since no other evidence is mentioned — is the assertion that “The bones, the trachea and larynx and the sexual organs proclaim approximately the age of specimens carefully examined.” This is quite true in regard to young birds not more than five or six months from the nest; but that it is equally true with respect to those which have nearly or quite completed the first year of their existence I am not at present prepared to believe, although my personal experience in comparing the bones, sexual organs and other internal parts of birds of many different kinds has perhaps been quite as extensive as that of Dr. Dwight. The matter has always interested me, and

during the thirty or more years when I was actively engaged in collecting birds I lost no opportunity of ascertaining by dissection, whenever possible, the approximate ages of my specimens. With those taken in summer and autumn there was seldom any trouble but by midwinter I found it difficult, and by early spring practically impossible, to decide with certainty as to whether a bird was more or less than one year old. I was accustomed to use a strong lens (but never, I will confess, a microscope), and to give attention to every detail of structure which I found available as a test of age. Hence my skepticism with regard to Dr. Dwight's confident claim. Nor has this, moreover, received the positive endorsement of any one whom I have consulted about it. Mr. H. W. Henshaw has assured me that his experience in determining the ages of birds by dissection has been closely similar to my own. Dr. C. Hart Merriam writes me that he does "not know any way by which the age of a duck killed in winter may be positively determined." Dr. Leonhard Stejneger that he is "not in a position to either deny or affirm Dr. Dwight's assertion." Mr. F. A. Lucas that he is "unable to say whether or not it would be possible to speak positively as to" the ages of ducks taken in winter "after an examination of the bones," although he has found that "in many of our small birds the back of the skull does not ossify so rapidly as the rest of it and in most cases one can usually tell whether a bird is a year old or more." Some of these statements are accompanied by others, equally qualified or non-committal, to the effect that thorough cleaning of an entire skeleton, microscopic examination of some of the parts of the bony structure, or minute examination of the generative organs and their tissue, might reveal characters by which a bird less than a year old could be identified as such. Although chiefly negative in character this testimony establishes one interesting and rather significant fact, viz., that some of the most eminent and experienced ornithologists in this country are still in ignorance or doubt about a matter to which they must have given more or less attention and concerning which Dr. Dwight lays claim to definite and exact knowledge that has escaped their ken. If his age tests be really trustworthy he is to be credited with exceptional acumen for discovering them; but if, on the other hand, they should prove to be unreliable he will have shown himself oblivious to elements of

uncertainty which should not have been overlooked or ignored. Thus he would seem to have placed himself in a position which makes it desirable if not imperative for him to describe fully and clearly the precise methods of dissection which he is accustomed to follow and the resulting proofs of age and immaturity on which he so implicitly relies. When he has done this it will be easier to judge whether his interpretation of the color variations in Black Ducks is or is not literally correct.

It is considered legitimate, I believe, to turn the guns of an opponent against his own fortifications provided one can make such use of them. If, then, I may be permitted to restrict Dr. Dwight's account of the progressive color changes in the bill, legs and feet of Black Ducks to the form *rubripes* it will be of direct service to me. For if, as I am quite ready to believe — having no grounds for maintaining the contrary — the legs and feet of young *rubripes* are not much more strongly reddish in autumn and early winter than are those of young *tristis*, and if the former bird does not acquire the full coloring of these parts until he is nearly or quite one year old, it is easy to account for the undeniable large percentage of autumnal and winter specimens which seem to be intergrades between these races by assuming that very many of them are immature representatives of *rubripes*. This, of course, is in the nature of a tentative and possibly untenable proposition. Not so, however, with the moral which I propose to draw from another of Dr. Dwight's statements already quoted and expressed in the following words: "Once the adult colors of the soft parts are attained they are never lost." This assurance, coming from one who speaks with such confidence and authority, is peculiarly welcome. For it encourages me to believe that a doubt, which I have hitherto entertained, may be unfounded and a claim, on which I have hesitated to insist, justified. The doubt has been as to whether fully mature Black Ducks, showing bright coral red legs and feet in late autumn, winter and early spring, may not afterwards have these parts dull colored in late summer and early autumn — the seasons of "eclipse" plumage with so many of the Anatinae. The claim — directly affected, it will be perceived, by the doubt — is that if no such retrogressive change ever takes place the apparently undisputed fact that Black Ducks with conspicuously red legs are wholly absent

from New England during the earlier part of the shooting season in autumn, and not found in any numbers much before the middle of October, affords the strongest kind of presumptive evidence that *rubripes* is a good subspecies. The very earliest date given by Dr. Townsend for its autumnal appearance in Essex County, Massachusetts, is September 21. It was represented by only seven specimens among the two hundred and sixty birds sent to Faneuil Hall Market in Boston from this region between September 21 and October 3, 1904, and examined for Dr. Townsend by that excellent authority on such matters, Mr. John H. Hardy, Jr. Of the unstated but presumably considerable number of specimens received between September 1 and 21 of that year Mr. Hardy referred *all* to "the smaller form" (*i. e.*, *tristis*). Equally significant and convincing is the testimony relating to this point furnished by Dr. J. C. Phillips, who has a shooting stand at Wenham Lake, in Essex County, where he has given close attention to the migrations of water fowl for a number of years. He writes me as follows (under date of March 24, 1910) in response to my enquiry as to when the Red-legged Ducks appear there in autumn: —

"I have been through all my records for Wenham and find the following dates: —

September 29, 1904.	One Red-leg Duck; weighs 2 lbs. 9 oz.
October 3, 1907.	" " " " " 3 "
" 9, 1906.	" " " " "

These are very early dates or they would not have been noted. . . . The large, heavy-feathered ducks [*i. e.*, *rubripes*] are not common before October 20." He adds: "The more I ponder on the subject, the more I become satisfied that there are two types of ducks, but I don't think that the red legs are the whole story.¹ While at Currituck last Christmas, I was very much struck by the pre-

¹ Although I continue to believe that the coloring of the legs and feet is conspicuously red in typical examples of *rubripes* and essentially brown or brownish in those of the bird I have called *tristis* I should not be greatly surprised to find that this character is more or less inconstant and unreliable. Even should it prove quite worthless there would remain the obvious differences in size and plumage to which I called attention in the original description of *rubripes*. Dr. Phillips appears to regard them as racial, not age, differences and Col. John E. Thayer assures me that he is of the same opinion. As Dr. Dwight said little or nothing about them in his paper I do not feel called upon to restate or to rediscuss them in the present connection.

ponderance, in our bags, of very large 'winter' ducks. I weighed a large number and many went to 6 lbs. to the pair. I shot numbers [of Black Ducks] in this same region twelve years ago and then we were always surprised to see any of these big ducks. . . . Gunners have spoken to me of the same thing, that is, a change in the type of Black Duck during the last few years at Currituck. . . . At the same time, up here in Wenham, we don't get the September flight of small ducks [*i. e., tristis*] that we used to get along from 1900 to 1905, and yet there are full as many late November and December Black Ducks [*i. e., rubripes*] around the ponds. Can it be that the big duck is taking the place of the smaller one, he being perhaps a shyer bird with more distant breeding grounds, and that the small duck has suffered more during the general decrease in water-fowl."

At Lake Umbagog I have never met with *rubripes* at any date earlier than September 27 (1889), although during the twenty or more years when I was accustomed to spend the greater part of every autumn there I must have examined fully two hundred freshly killed Black Ducks shot in September, to say nothing of the thousands of living birds seen at close range under conditions which enabled me to make sure of the coloring of their legs and feet. Of the specimens actually taken very many were shown by dissection to be more than one year old. That no one of them had passed the maximum age when, according to Dr. Dwight, *all* Black Ducks assume the bright red coloring of the legs and feet, never afterwards to part with it, is obviously improbable if not, as I believe, simply inconceivable.

Another fact of some apparent significance is the tendency shown by Black Ducks having red legs to keep together; either wholly by themselves, in small flocks, as I have repeatedly known to happen in late autumn at Lake Umbagog, or in pairs or clustering groups, when mingling with brown-legged birds, as I have witnessed in early spring in Massachusetts. An interesting instance of the latter kind came under my notice in March, 1909. On the 16th of the month Mr. Purdie and I found eighty-four Black Ducks assembled at Fresh Pond where all but a few, swimming in open water, were standing on a great raft of floating ice, basking in the morning sun. With the help of its clear rays and of a strong glass I was able to satisfy myself that there were only fifteen representatives of *rubripes*

among the total number on the ice — a surprisingly small proportion of “adults” to “immature” birds if Dr. Dwight’s opinions are correct. All the birds satisfactorily seen had legs either bright red — almost as deep and pure as that of red sealing wax — or dull brownish, there being no indication of intergradation in this respect. Four red-legged birds stood together in one place; in another there were five with a single brown-legged bird; in still another four, represented by two mated pairs separated by a space of only a few yards. The remaining two were far removed from the others and among brown-legged birds. Although most of these ducks were unquestionably wild ones, about to migrate to breeding grounds lying further north, a few may have strayed from some of the park ponds in Boston or Brookline where miscellaneous collections of semi-domesticated water-fowl are kept. I mention this slight uncertainty partly to guard myself against the possible accusation of inconsistency which might be suggested by a criticism that I shall make presently of certain observations of park water-fowl by Dr. Dwight. It can scarcely fail to be recognized, however, that the two cases are not parallel, or to be admitted that even if a few of the birds seen at Fresh Pond were not really wild, the fact has little or no obvious bearing on the use I have made of the evidence they furnished. Where I refer to “pairs” I mean that each of these consisted of a drake and a duck, not of two birds of unknown sex. It is perfectly easy — at least in spring — to distinguish male from female Black Ducks when mated birds are standing together on ice or land and not too far off; for the males are decidedly larger than the females and also appreciably different in form and carriage.

Although Dr. Dwight is given to insisting that no one unprovided with full series of birds taken during the breeding season, in their summer haunts, should presume to pass upon questions in which the value or significance of differences of color or markings is involved, his paper on Black Ducks lacks satisfactory assurance that, with the exception of a single specimen, any of the birds he mentions were obtained in localities where they had certainly settled to breed. He apparently admits, and at the same time defends, this violation of his favorite rule by pointing out that “There are many difficulties to be overcome in obtaining breeding specimens which of course

would settle the question at once. The males become exceedingly shy and difficult to find in the breeding season and nobody wants to slaughter brooding females even if nests be found." He goes on to say, however, that "before spring shooting was abolished some years ago on Long Island, New York, a number of freshly killed birds were sent me that scarcely needed dissection to prove them breeding birds. They were shot at various dates in April and all had red legs." To those unfamiliar with certain known facts of migration the evidence furnished by the two sentences last quoted may seem important, but that an ornithologist of Dr. Dwight's knowledge and experience can attach any special value or significance to it is indeed surprising. He must know, of course, that in April — or May, for that matter — thousands of birds whose *individual* summer homes lie further to the northward may be found lingering in the New England and the Middle States at dates when others of the same or of closely allied species are sitting on their nests and eggs in the same neighborhood. Indeed it is unsafe to assume that the mere presence of migratory birds of any kind at localities not near the extreme northern limits of their summer ranges, affords any proof that they are breeding in such localities unless they occur there within that limited period in early summer when the waves of migration are wholly at rest. In the case of ducks, moreover, physical evidences of "breeding condition," such as Dr. Dwight may be assumed to refer to in what he says of his Long Island specimens, have apparently little or no real significance of the kind he gives us to understand. For although Golden-eyes and Goosanders do not lay their eggs in northern New England before late April or early May and are not known or suspected to ever breed anywhere in Massachusetts, they have been seen copulating in March near Boston and in the waters about Cape Cod.

Perhaps, after all, Dr. Dwight is better informed about some of these matters than the passages just quoted would seem to imply, for he follows them by the admission that "it was not until the present year that I secured the last link required in my chain of evidence." This, it appears, was furnished by a freshly-killed bird shot "on Long Island, June 11, 1909." It had "the red legs and other characters supposed to belong to the northern 'form' alone" and "evidently was recently mated." Hence Dr. Dwight insists that

"it should set at rest any lurking belief in the subspecific distinctness of *rubripes*." He calls "attention to the fallibility of trained gunners when a question of scientific importance is at stake," adding: "The very man who shot my June bird had previously assured me that the summer birds of Long Island did not have red legs." Dr. Dwight then goes on to say that he has "noticed, without a glass, that the wild birds breeding about the Central Park lakes in New York City have red legs, but such evidence, derived from semi-domesticated water-fowl, is not convincing in itself alone." Considered in the close connection in which it occurs with the passage expressing disparagement of the opinions and methods of observation of "trained gunners" this last statement is rather amusing. That a trained ornithologist, dealing with a question of scientific importance, should have made it without perceiving that so far from strengthening, it positively tends to discredit, some of his other evidence and conclusions, is not a little surprising. For, as almost everyone knows, the water-fowl now kept in such numbers and variety in or near New York, Boston, and various other large cities are, for the most part, of obscure if not unknown origin. Purchased from Sportsman's Shows or from dealers in remote parts of North America and the Old World they intermingle and probably also interbreed, producing offspring of even more uncertain antecedents than their own. Some of them are pinioned but many are not thus handicapped, having free use of their wings and unrestrained liberty, wander more or less widely, returning to the park ponds every now and then or deserting them altogether, as circumstances or inclination dictate. They often join, or are joined by, wild migrants of the same or of allied species and even occasionally mate with them it is thought — although not as yet definitely ascertained. In such collections of living water-fowl the Red-legged Black Ducks are often rather numerous represented. Their presence in them has, of course, no more significance than has that of the Wood Ducks kept in such profusion in ornamental ponds in various cities in Europe. In view of all these facts why is it not possible — or rather probable — that the "June bird" shot on Long Island came originally from some of the lakes in Central Park or the Bronx? It may even have been one of the very ducks — "wild" or "semi-domesticated," which are we to

call them? — which Dr. Dwight viewed with such satisfaction there when the momentous question as whether *rubripes* has or has not “a leg left to stand on” was perhaps still agitating his mind. Should such a suggestion be brought to the attention of the slayer of the “June bird” it would be likely to strengthen his original belief that the wild Black Ducks which occur on Long Island in summer do not have red legs. For men of his sort are apt to be tenacious of opinions based on personal experience — thereby differing from trained ornithologists.

Nothing that I have said in the course of the present article or in any previous connection should be taken to imply that I am or ever have been, absolutely assured that the Red-legged Black Duck is a good subspecies. All I claim is that the bulk of the evidence seems to point that way and more decidedly now than it did before Dr. Dwight’s article was written. As I have already explained, some of his most confident statements have given me unexpected comfort and support, although intended by him to serve a directly opposite purpose. It may be, or course, that I have made incorrect use of them and also, as he thinks, of the results of my own study and observation. But that remains to be shown, for there is obvious need of additional evidence more definite and convincing than any thus far produced before the question can be finally settled. If, perchance, it be decided against Dr. Dwight, I promise not to insist on his serving as a warning to any one. Should the spirit of charity and forgiveness, which all good Christians are supposed to cultivate and to act upon at every fitting opportunity, be expected to go further than this?

HENSLOW'S SPARROW AS AN OHIO BIRD.

BY W. F. HENNINGER.

Plate XVIII.

AUDUBON took this sparrow at Newport, Kentucky, opposite Cincinnati, and states: "It is accidental in Ohio." It was not taken in Ohio for years and Audubon's statement was considered an error. But time has shown him to have been correct in this statement as in many other instances, where others failed and the sharp-eyed master succeeded. Dr. Wheaton, in 1882, included this bird in his Ohio List on this statement of Audubon. Neither he nor Oliver Davie knew anything of this species as an Ohio bird. Their opinion that it would be found in southern and western Ohio as a breeder has never been proved. In the meantime Jones and Dawson were working up the northern part of the State and took a specimen in 1894 near Oberlin in Lorain County, and Dawson in his book 'Birds of Ohio,' follows it up with the remark: "they undoubtedly bred there." On September 25, 1906, I met two migrating Henslow's Sparrows (Wilson Bull., Dec., 1906, p. 136) near Tiffin, Seneca County, Ohio. In 1907 and 1908, Mr. E. W. Vickers of Ellsworth Station and Geo. L. Fordyce of Youngstown recorded an invasion of this sparrow in Mahoning County, Ohio (Wilson Bull., Sept., 1908, pp. 150-152).

To these records I now add two more. On October 8, 1894, I took what I thought to be a specimen of this bird at South Webster, Scioto County, migrating with other sparrows, and as I knew the species in my home State (Missouri) I was about sure of the identification. Unfortunately I lost the specimen and consequently never reported anything about it as my hypothetical list of Southern Ohio Birds (Wilson Bull., Sept., 1902) was already too large. In 1904, I took a nest and 4 eggs of this species near Tiffin, Seneca County, and have kept this note back since then, partly because I wanted more evidence and a still better confirmation of my record before rushing into print, and partly because I had packed the eggs away where I could not conveniently get at them. Recently when



HENSLOW'S SPARROW. TIFFIN, O., JUNE 3, 1904.

GRASSHOPPER SPARROW. TIFFIN, O., JUNE 3, 1984.

going over my collection I concluded that the time had come to make this record public.

For the benefit of other ornithologists I will relate the circumstances in detail. One of my young parishioners at Tiffin, a farmer, told me they were going to mow a rather swampy meadow of clover on June 3 and said: "Those birds you showed me on May 28 on that 7½ acre patch are nesting there, I believe." So I took my camera outfit and tramped along the Big Four R. R. tracks three miles northeast of Tiffin, jumped across a big ditch and slowly worked my way over several swampy meadows to the above mentioned clover field. It was very wet and every ten feet a furrow about six inches deep had been run through it lengthwise. Bobolinks were all around us and a beautiful nest of the Meadowlark with 6 eggs was photographed at once. There were no Swamp, Song nor Field Sparrows near, but there were Grasshopper Sparrows, and we found two of their nests of five and four eggs. Almost in the center of the meadow we flushed a sparrow from her nest of four eggs, but I could not get a satisfactory view of it as it was running through the grass, and unfortunately I had no gun with me. We heard the faint note *tse seēp* (thus it sounds to my ear) several times, but try as we could we never again caught or flushed the bird on the nest, although I was well nigh positive the species was Henslow's Sparrow. The nest was sunk into the ground at the base of a grass tussock near one of the furrows and arched over. In taking the picture I did not use the tripod but simply placed the camera on a higher grass tussock nearby. The day wore on, but that sparrow was not to be caught; the next day I had to leave town, and when the twilight was falling, I collected the nest and eggs and it has rested in my collection since that day.

Recently I wrote a letter to Mr. J. Claire Wood of Detroit, Mich., a fellow member of the Wilson Club, who had taken the eggs and nest of this bird in Michigan in 1905 (Auk, Vol. XXII, p. 416), and he was so kind as to send me his set of four (now three) eggs of this bird for comparison. His set and mine agree perfectly in color pattern — a wreath of reddish and lavender specks at the dull end with numerous small reddish specks over the body of the egg on a greenish ground color. The greenish tint of the ground color is more pronounced in his eggs than in mine, while mine are more

uniform in their coloration, all agreeing with one of his eggs. His nest agreed with mine also in location. His set (3 eggs) measures 18.54×13.46 ; 18.80×13.46 ; 18.54×13.72 mm. My set (4 eggs) measures 18.54×13.75 ; 18.25×13.75 ; 18×13.50 ; 18.75×14 . They look like a large edition of Field Sparrow eggs, but bear no resemblance to any other sparrow eggs in Ohio. In form they are oblong oval, the Grasshopper Sparrow's eggs are ovate squatty in shape with a polished white ground color.

Thus it will be seen that even though I did not capture the bird, there is no doubt whatever that I found *the first authentic nest and eggs of Henslow's Sparrow in Ohio*, and that Jones and Dawson were correct in their view that Henslow's Sparrow is a rare and irregular breeder in Ohio. To show the difference I have also added a photograph of the Grasshopper Sparrow's nest and eggs. Both pictures are simply loaned to 'The Auk,' and republication in any other work will be strictly dealt with according to law. I am under great obligations to Mr. J. Claire Wood for his kindness and help. And finally I have no doubt that Henslow's Sparrow will be found in many other places in Ohio by careful and competent observers.

GENERAL NOTES.

Black Brant (*Branta nigricans*) in Massachusetts.—As this bird is one of the very rarest in Massachusetts, and also is but a rare straggler on any part of the Atlantic coast, every instance of its being taken should be placed on record. I heard of one of these Brant being killed some years ago at Chatham, and upon further investigation found the bird in the collection of Mr. W. A. Carey of Boston. It was shot on April 15, 1902, and was one of a flock of seven Brant, and the only one killed. That spring there was an unusually small number of Brant at Chatham, and the party at the Monomoy Brant Club, the week that Mr. Carey was there, killed but very few birds. Curiously enough this was the only one that he himself shot. I supposed that it had been reported long ago and was much surprised to find that it had been overlooked, though a number of people knew of its existence. This is only the second record for the State, the other being one reported by C. B. Cory as killed in the spring of 1883, also at

Chatham.¹ There seem to be but very few records for the Atlantic coast. Two were shot in New Jersey on April 5, 1877²; one was shot by Augustus Dexter on Oneida Lake, N. Y., on October 30, 1891,³ and only three have ever been reported from Long Island, all from Great South Bay. One was taken in 1840,⁴ one in 1889,⁵ and one in 1908.⁶ As far as is known these are the only three from that locality. This then makes but seven records for the Atlantic coast, with a total of but eight birds.⁷—S. PRESCOTT FAY, *Boston, Mass.*

Notes on *Chen caerulescens*, *Chen rossi*, and other Waterfowl in Louisiana.—While Audubon's statement that "The Snow Goose in the grey state of its plumage is very abundant in winter, about the mouths of the Mississippi, as well as on all the muddy and grassy shores of the bays and inlets of the Gulf of Mexico as far as the Texas"⁸ undoubtedly refers to *Chen caerulescens*, and, notwithstanding the fact of the occurrence of the species in large numbers in that region has been reiterated by Beyer⁹ and McIlhenny,¹⁰ the impression is general that the Blue Goose is a rare bird.

Professor Cooke speaks of it as "this rather rare goose,"¹¹ and Sanford says: "In its full spring plumage the Blue Goose is seldom taken in the . . . United States, and it is perhaps the rarest of our geese."¹² Moreover, these statements are typical of allusions to the species in most ornithological writings.

It was with pleasure therefore that the writer, while on a trip in the interests of the Biological Survey, during the past winter, found the Blue Geese abundant in southern Louisiana, probably just as numerous as in the days of Audubon. The localities visited were the delta of the Mississippi River, specifically, Octave, Main, 27, and other passes entered through Cubit Gap, and Belle Isle and the surrounding region to the west of Vermillion Bay. Not only were Blue Geese found in flocks of thousands, but it was learned also that on account of their great numbers, they do much damage to pastures, especially in the vicinity of Belle Isle and Chenjereau-Tigre.

¹ Cory, C. B., *Auk*, Vol. I, 1884, p. 96.

² Scott, W. E. D., *Bull. Nutt. Ornith. Club*, Vol. IV, 1879, p. 226.

³ Bagg, Egbert, *Auk*, Vol. XI, 1894, p. 163.

⁴ Dutcher, William, *ibid.*, Vol. X, 1893, p. 271.

⁵ Dutcher, William, *ibid.*, Vol. X, 1893, p. 266.

⁶ Herrick, N. L., *ibid.*, Vol. XXV, 1908, p. 473.

⁷ [To these should be added the type specimen of the species, taken at Great Egg Harbor, New Jersey, in January, 1846 (*cf.* Lawrence, G. N., *Ann. Lyc. N. H. N. Y.*, IV, 1846, p. 171, pl. xii), and two others taken later the same winter. There are also several later records for New Jersey in addition to those given above (*cf.* Stone, *Birds of New Jersey*, 1908 (1909), p. 96).—ED.]

⁸ *Orn. Biogr.*, V, 1838, p. 562.

⁹ *Proc. Louisiana Soc. Nat.*, 1900, p. 90.

¹⁰ *Auk*, XIV, 1897, p. 287.

¹¹ *Bull.* 26, Biological Survey, 1906, p. 68.

¹² *The Waterfowl Family*, 1903, p. 227.

In the Mississippi delta the Blue Geese rest by day on mud flats bordering the Gulf. At the time of my visit (January 29 to February 4, 1910) these were entirely destitute of vegetation, a condition to which the geese had reduced them by their voracious feeding. Every summer these flats are covered by a dense growth of "cut grass" (the local name for *Zizaniopsis miliacea*), "goose grass" (*Scirpus robustus*), "oyster grass" (*Spartina glabra*), "Johnson grass" (*Panicum repens*), and cat-tails or "flag-grass" (*Typha angustifolia*), and every fall are denuded by the Blue Geese or Brant as they are called in the delta. The birds feed principally upon the roots of these plants but the tops of all are eaten at times, if not regularly. Each goose works out a rounded hole in the mud, devouring all of the roots discovered, and these holes are enlarged until they almost touch before the birds move on. They maintain themselves in irregular rows while feeding, much after the manner of certain caterpillars on leaves, and make almost as clean a sweep of the area passed over.

In the Belle Isle region the method of feeding is the same except that the birds feed by day, but the places frequented are what are locally known as 'burns,' that is, areas of marsh burned over so that new green food will sooner be available for the cattle. These pastures, for the most part, are barely above water level, so that the holes dug by the geese immediately fill with water. Continued feeding in one area produces shallow, grass-tufted ponds, where formerly there was unbroken pasture. Some of these ponds are resorted to for roosting places, in which case the action of the birds' feet further deepens them, and veritable lakes are produced, which the building-up influence of vegetation cannot obliterate for generations, and never, in fact, while the geese continue to use them.

The numbers of the Blue Geese are so great that these effects are not local but general. At Chenjere-au-Tigre, one proprietor formerly hired from two to four men at a dollar a day, furnishing them board, horses, guns and ammunition, and keeping them on the move constantly in the daytime to drive the geese away. The attempt was unsuccessful, however, and fully 2000 acres of pasture were abandoned. Other proprietors had similar experience and suffered loss of the use of hundreds of acres.

Besides Blue Geese, Canada Geese and Snow Geese are numerous. One goose among about every 25 Blue Geese is white. These white birds do not flock together but are always scattered among the blue and are regarded by the hunters as belonging to that species. A specimen collected in the delta of the Mississippi is referable to the lesser western form, *Chen hyperborea*. It should be recorded also that a specimen of *Chen rossi* was taken February 23, 1910, on the shore of Little Vermillion Bay, La., near the mouth of the Vermillion River. The nearest previous captures were made in northern Chihuahua, Mexico, and in Colorado.

Being so localized in their winter range, it might seem that the Blue Geese are in danger of extermination. But they are so wary and so few hunters molest them that at present there is no appreciable reduction in their numbers by man. The same is true, I feel sure, of the winter colonies of

Snow Geese and Swans on Currituck Sound, North Carolina. So long as conditions remain the same, the birds being very wary, and having little market value there is no incentive to kill them, nothing occurring during their stay in the United States will materially lessen the numbers, nor even interfere with the increase of these fine birds. However, if they should become an object of pursuit, it is equally true that they would diminish very rapidly.

Specimens of *Anas fulvigula maculosa* were obtained at Belle Isle, La., March 2, 1910. A male *Anas tristis* was apparently mated with one of the mottled ducks. Some of the hunters of Louisiana urge an extension of the open season on the plea that the Mottled Ducks leave the State in winter. I may say, however, that all of the evidence of intelligent persons living in the range of the species, confirms what has often been recorded, namely, that the Mottled Duck is resident. They may be absent in winter from localities they frequent even in large numbers in summer, but they remain in the same general region. As one hunter expressed it "they spread out." The bird is not well known among the hunters at large over the State, from the fact that the range is limited to a narrow strip along the coast. They have heard of it, however, under the names of Summer or Mexican French Duck, or Mallard, and as they get no such duck when shooting, jump to the conclusion that it migrates before the hunting season. Hence the clamor to get at it.—W. L. McATEE, *Biological Survey, Washington, D. C.*

Another King Rail in Massachusetts.—Mr. Richard M. Russell shot a King Rail (*Rallus elegans*) on Sandy Neck, West Barnstable, Mass., on December 30 or 31, 1909. This is I believe the ninth record for the State. The bird was very emaciated when shot, and quite tame. Mr. Russell has deposited the specimen, mounted, in this Museum from which it will be transferred to the Boston Society of Natural History.—R. HEBER HOWE, JR., *Thoreau Museum, Concord, Mass.*

Knot (*Tringa canutus*) Wintering in Massachusetts.—The winter records of our shore birds are so scanty that any new addition should be very welcome, and in this connection I want to record the taking of two Knots at Chatham on Dec. 31, 1909 — the very last day of the year. A friend of mine to whom the birds were sent identified them, which he described as being in the immature gray plumage and in as good condition as fat young birds killed in the early fall. A party from Chatham were out after rabbits on Monomoy Island near the flats and marshes which the shore birds frequent in summer, when these two birds flew by. As they were thought to be Black-bellied Plover the corresponding whistle was given, whereupon both birds wheeled about, and as they came nearer they were seen to be Knots. They were shot and both fell on solid ice. As the last week in December was bitterly cold, in fact the coldest part

of the winter, for the thermometer several times touched zero, it seems strange that these birds should have stayed north, especially as everything was frozen up and the flats and feeding grounds were covered with ice. How they managed to find any sustenance, to say nothing of their being fat, seems a mystery. That same week I was on Martha's Vineyard Island where I found a male Chewink wintering, which I reported in 'The Auk,' Volume XXVII, p. 220.—S. PRESCOTT FAY, *Boston, Mass.*

Breeding of the Long-eared Owl in Philadelphia County, Pa.—It appears almost incredible that any of our larger hawks and owls can exist in such a densely populated locality as Philadelphia, yet, to our surprise and wonder, they somehow manage to subsist, despite the ruthless warfare waged against them by ignorant gunners and farmers, who kill them upon every occasion. In view of these facts it is a mystery to me why our larger Raptores have not long ago been extirpated as breeders in this vicinity, but such seems not to have as yet happened, as their occasional discovery nesting indicates.

The Long-eared Owl (*Asio wilsonianus*) is one of these much maligned species. It now is of decidedly scarce occurrence even as a winter visitant and is a rare breeder. It is so rare in Philadelphia that I have not seen any since December, 1902, and have only several other subsequent records of them from near the city.

Although I have never actually found a nest in Philadelphia I have seen the young, which establishes a record of its breeding. On June 9, 1898, in a big, thick wood at Frankford, I discovered four fledgling Long-eared Owls huddled together about thirty feet up in a scrubby scarlet oak. When disturbed they flew weakly about in a bewildered manner in all directions, and their discovery by the inhabitants of the wood had made them almost distracted. They were evidently raised in one of the many Crow's nests in the wood. A pair of Long-eared Owls was seen in this wood on March 14, 1902, but subsequent search for them and their nest was fruitless, and I have no doubt that the birds were shot.—RICHARD F. MILLER, *Harrowgate, Philadelphia, Pa.*

Northwestern Saw-whet and Snowy Owls in Oregon.—On Nov. 30, 1909, a hunter shot a fine adult female Snowy Owl (*Nyctea nyctea*) at Sheridan, Dougal Co., Oregon. It was perched on a large stump beside the trail in heavy forest. Mr. Frank Baker, a Portland, Oregon, taxidermist, has three Northwestern Saw-whet Owls (*Cryptoglaux acadica scotæa*) collected in Douglas County during the summer of 1899. Both these Owls are rare in this part of the State.—STANLEY G. JEWETT, *Portland, Oregon.*

A Hybrid Flicker in Eastern Missouri.—On Feb. 6, 1910, on the bank of the Meramec River, ten miles southwest of St. Louis, I found dead a Flicker, a hybrid of the Northern (*Colaptes auratus lutes*) and Red-shafted

(*Colaptes cafer collaris*). The three outer primaries on each wing, and the three outer tail feathers were strongly marked with red, the two outer primaries being entirely colored on the under side. The other markings were those of a male Northern Flicker. The bird had apparently been hurt. There is no record of a hybrid Flicker for any except the extreme western portion of Missouri, and it is not mentioned at all in Cory's lately published list of the birds of Illinois and Wisconsin. Dr. Otto Widmann, in his 'Birds of Missouri,' cites several records of typical Red-shafted Flickers in Courtney County, in the extreme western part of the State.—ROGER M. BALDWIN, *St. Louis, Mo.*

The Wintering of Meadowlarks at Pine Point, Maine.—Referring to Mr. Arthur H. Norton's notice¹ of the wintering of Meadowlarks (*Sturnella magna*) at Pine Point, it should be said that I have seen these birds there almost daily throughout the past three winters. Making their home in the thick woods near by, they obtained their food from the marsh. During the winter of 1907-08 a flock of eight stayed in the vicinity of the railroad station, being frequently seen on the adjacent marshes. The next winter the flock was increased to about twelve or fourteen birds. I saw them nearly every day all through the winter. In very cold weather, when the grasses and weeds of the marsh were buried beneath the snow, they would venture up to the railway station and pick up grain which had fallen from the freight cars. That they enjoyed their winter stay at Pine Point seems evident, for the past winter a flock of thirty-five or forty birds spent the cold months with us. In February, when the marsh was deeply covered with snow, I frequently walked out near the river, scraped off snow from small patches of grass and fed the larks with grain — cracked corn, oats and barley. They evidently relished this, for it was eagerly devoured. On warm days in January and February they often alighted on the telegraph wires and sang. One could scarcely realize then that it was midwinter.—FRED. S. WALKER, *Pine Point, Maine.*

Calcarious lapponicus at Monomoy, Mass., in April.—At Monomoy, Mass., on April 10, 1909, I saw at least twelve Lapland Longspurs (*Calcarious lapponicus*), two of which I secured. The birds were apparently feeding on the seeds of the coarse salt grass, which grows on the edge of the marsh near the flats and is partly covered at high tide.

During the three or four previous days, I saw small flocks of Lapland Longspurs at different times, but as I was not at Monomoy after April 10, I do not know how much later the birds remained.—CHAS. R. LAMB, *Cambridge, Mass.*

The Chestnut-collared Longspur in Illinois.—On April 24, 1910, my friend Mr. Gerard Alan Abbott, while investigating bird life on the prairies

¹ Auk, Vol. XXVI, p. 308.

near Orland, a few miles southwest of Chicago, came across about two hundred *Calcarius pictus*. Among them were ten or a dozen *Calcarius ornatus*, a bird of the western plains, heretofore not recorded from Illinois. The birds were not very shy, allowing a near approach, and were positively identified by Mr. Abbott, who is well acquainted with the species in the field, having previously taken specimens in Dakota and Montana.—HENRY K. COALE, *Highland Park, Ill.*

The Type Locality of *Vireo belli*.—Audubon described *Vireo belli* without giving any type locality. The type specimen is now in the United States National Museum, and is labeled "Fort Union (?) Mr. Audubon." This specimen is quoted without the question mark in Baird's 'Birds of North America,' 1858, p. 337; in Baird's 'Review of North American Birds,' 1866, p. 358, as "Fort Union, Dec. 1843"; while in Baird, Brewer and Ridgway's 'North American Birds,' I, 1874, p. 389, the type locality is given as "Missouri River," and the statement is made in the text that this species was first procured "in what is now known as Dakota Territory." The latest manual, Ridgway's 'Birds of North and Middle America,' III, 1904, p. 204, gives the type locality as "Fort Union, Dakota, type in Coll. U. S. Nat. Mus."

There seems to be no foundation in fact, in any of these statements, for giving Fort Union as the type locality. *Vireo belli* was described by Audubon in his 'Birds of America,' octavo edition, 1844, p. 333, and he says, "On the same day that Harris' Finch was procured, Mr. J. G. Bell . . . shot one of the species which I am now about to describe." On page 331 of the same volume, under *Fringilla harrisii*, the statement is made that the "first specimen seen was procured May 4, 1843, a short distance below the Black Snake Hills." Therefore, according to this statement, the type of *Vireo belli* was secured May 4, 1843. From the journal of Audubon, it is known that at this date he was a few miles below St. Joseph, Mo., and under this date he speaks of securing "a new Finch" (Audubon and his Journals, by Maria R. Audubon, I, 1897, p. 470), but he says nothing of any new Vireo. Two days later, however, he says: "Bell also shot a small Vireo, which is in all probability a new species (to me at least)." This is the *Vireo belli*, and at this date the party was at St. Joseph, Mo. There is thus a discrepancy of two days between the date given in Audubon's journal and that mentioned in the original description of *Vireo belli*. Audubon's journal mentions that another specimen of the Harris Finch was shot on May 6, and it is evidently this specimen that Audubon remembered when he wrote that Harris's Finch and Bell's Vireo were taken the same day. The type of *Vireo belli* was therefore taken May 6, 1843, at St. Joseph, Mo.

Audubon makes the explicit statement in the original description of *Vireo belli* that he found it "as far up the Missouri River as Fort Union." This is probably a mistake, as no subsequent observer has noted the species farther north than southern South Dakota.

The label on the type specimen was evidently not written by Audubon himself and whoever wrote it had doubts as to the correctness of the locality.

Old Fort Union is the type locality of several species, but writers and geographers have disagreed as to whether the Fort was in North Dakota or Montana. Mr. E. A. Preble, of the Biological Survey, visited the site a few days ago and finds that the present Montana-Dakota line cuts right through the site of the old fort, but as most of the buildings were on the Dakota side, it seems best to consider that Old Fort Union was in North Dakota.—WELLS W. COOKE, *Biological Survey, Washington, D. C.*

The Redstart in Southern New Jersey in Summer.—The Redstart is a rare summer resident in southern New Jersey, and it is only of late years that it has been commonly observed at this season.

On the Pensauken Creek, as far back as 1894 or 1895, in September, I collected a nest that was undoubtedly of this species. It was found well in a wood on the high bank of the stream, above Parry, on the Burlington County side, and was placed in the crotch of a white oak sapling, about 20 feet from the ground. It differed appreciably in composition from nests of the Yellow Warbler, the only species breeding on the creek whose nests it resembled; but I have never yet found *Dendroica aestiva* nesting in woods. I had the nest several years in my collection and it was almost the exact reproduction of other Redstarts' nests I possessed, which were collected in New York and Pennsylvania.

Nevertheless, the Redstart does breed on the Pensauken Creek, as I saw a pair here on June 14, 1908, in a wood on the Burlington County side of the South Branch, above Fork's Landing, and observed a male in the same wood on June 13, 1909. But on both occasions I failed to find the nest.

At Fish House, Camden County, N. J., one was seen on June 3, 1906, but no search was made for its nest. A Blue-winged Warbler, another rare breeder in southern New Jersey, was observed on the same day at this locality.

It is my belief that the Redstart is increasing in South Jersey in summer, as it appears to be doing in southeastern Pennsylvania.—RICHARD F. MILLER, *Philadelphia, Pa.*

Providential Supply of Food for Birds in a Blizzard.—April 22, 1910, opened bright and warm. Fruit trees were in blossom, flowers everywhere. By night a heavy rain set in, followed by snow and a cold northwest wind. By morning it was mid-winter. Birds and plants were frozen, and there was several inches of snow on the ground.

Half-frozen and bedraggled, the birds huddled under the hedges or in the evergreens for protection from the blizzard. After breakfast I went out to shovel the snow off the walk, and was surprised to see throngs of

birds on the bare places in the road where the snow had been blown away. Upon investigating I found the road literally covered with earth worms, which the birds had discovered and were feasting upon.

There were hundreds of Rusty Blackbirds, Cowbirds, White-throated Sparrows, Hermit Thrushes, Robins, Flickers, Brown Thrushes, Bluebirds and Bronzed Grackles. By noon time the birds had had their fill and not a worm was in sight. All that night the blizzard raged, but the next day it moderated and I believe few if any of the birds perished.— HENRY K. COALE, *Highland Park, Ill.*

The Avocet and Other Shore-birds at Ithaca during the Fall of 1909.— In Eaton's recent exhaustive work, 'Birds of New York,' he states that "The last authentic specimens [of the Avocet] were obtained about 50 years ago on Long Island." In view of this fact and the general paucity of records for this bird in the east, it seems advisable to present a record made at Ithaca, N. Y., last fall. The bird when first seen was flushed amid a mixed flock of Lesser Yellow-legs, Pectoral Sandpipers, Sanderlings and Semipalmated Plover, Sept. 15, 1909. Later in the day it was seen feeding in its characteristic manner a short distance from this same flock but always keeping with them. The following day, Sept. 16, it was collected and is now in the C. U. collection (Ac. No. 5219). It is an adult male in full winter plumage.

In addition to the occurrence of the Avocet, the migration of other shore-birds during the fall was so unusual for this station that a short review of the records may be worthy of note. Normally the possible feeding grounds for these birds is rather scant as the lake shore is grown up to rank vegetation. This year (1909) however, due to the unusually low level of the lake, extensive mud flats and sand beaches were left exposed. Before the hunting season opened, these were teeming with birds and thereafter flocks were continually dropping in, although almost immediately frightened away by gunners. Morning and evening, three or four times a week, these flats at the head of the lake were visited and it is a summary of the records made that follows:

Lobipes lobatus. NORTHERN PHALAROPE.— Two specimens taken Sept. 23 and Sept. 27.

Recurvirostra americana. AVOCET.— A single specimen, Sept. 15 and 16.

Gallinago delicata. WILSON'S SNIPE.— The first individual was seen July 11. It was not again seen until Oct. 1, after which two or three specimens were seen each week until Oct. 20. It was not as common as usual.

Pisobia maculata. PECTORAL SANDPIPER.— First appeared Aug. 2; common until Sept. 16 when they disappeared. Oct. 13 they again became common but departed the same day, only a few remaining until Oct. 20.

Pisobia fuscicollis. WHITE-RUMPED SANDPIPER.— Three individuals were taken Oct. 13, and 5 seen Oct. 16. They were accompanying Pectorals but did not mingle with them.

Pisobia minutilla. LEAST SANDPIPER.—This species was recorded but once, on July 21, when several were seen.

Pelidna alpina sakhalina. RED-BACKED SANDPIPER.—Appeared Sept. 24 and straggled along until Oct. 27, never more than two or three being seen together.

Ereunetes pusillus. SEMIPALMATED SANDPIPER.—First seen July 21; was more or less common until Sept. 16; last seen Sept. 23.

Calidris leucophæa. SANDERLING.—A flock of five on Aug. 18 was the first appearance of this species. Sept. 15 and 16 it was fairly common, and was last seen Sept. 24.

Totanus melanoleucus. GREATER YELLOW-LEGS.—Appeared Oct. 12 and 13 when five were seen. A flock of seven on Oct. 17 is the only other record.

Totanus flavipes. YELLOW-LEGS.—A single individual seen Aug. 1; a flock of seven on Sept. 15 and 16; and five on Sept. 23 are the only records.

Helodromas solitarius. SOLITARY SANDPIPER.—Ordinarily a fairly common visitant, but only one specimen was recorded, Sept. 16.

Actitis macularia. SPOTTED SANDPIPER.—A rather common summer resident; it was last seen Sept. 16.

Squatarola squatarola. BLACK-BELLIED PLOVER.—First seen Sept. 3; a few scattering individuals then seen until Sept. 25.

Charadrius dominicus. GOLDEN PLOVER.—One individual taken Oct. 27 constitutes the only record for this species.

Oxyechus vociferus. KILLDEER.—On July 25, a flock of about 75 appeared. They continued common until Sept. 16 when the majority were frightened away. From the 16th of Sept. to Oct. 20 scattering flocks of from 3 to 50 appeared, so that they were never entirely absent from the beaches. The last record was made Oct. 27.

Ægialitis semipalmata. SEMIPALMATED PLOVER.—First appeared July 23; common until the 16th of September; a last straggler Nov. 3. This bird was poor in flesh and had probably been wounded.

Arenaria interpres. TURNSTONE.—On Sept. 15, three of this maritime species were seen running along the sand beaches, prying under shells, bark and bits of water plant in their characteristic manner. One was collected the following day in the same place.

Most of these records were not made in time to be included in the recent paper by Reed and Wright on 'The Vertebrates of the Cayuga Lake Basin, N. Y.' and hence we have the occasion of their presentation at this time.

It might be well in this connection to mention also the capture of a Yellow Rail (*Coturnicops noveboracensis*) at Ithaca, Nov. 3, and an immature King Eider (*Somateria spectabilis*) at the north end of the Lake (Cayuga), Nov. 26 by Mr. J. T. Lloyd.—ARTHUR A. ALLEN, Ithaca, N. Y.

Top-White on Mammals and Birds.—This is one of the points in our book (Concealing-Coloration) upon which some naturalists have not yet understood us. They have not read us carefully, and take our pictures

for mere illustrations of a theory. In every case, however, the picture *proves* the optical fact, and also shows the reader how he may for *himself* prove it out-of-doors, if he will carefully follow directions.

Take, for instance, our Figs. 114-115, which show photographs of a white card against a dark background and against the sky. In Fig. 115 the card is brightly conspicuous; in Fig. 114 it has *vanished from its place*, merely because it was photographed from *two feet lower down*. Surely naturalists must realize that the visible card makes a certain impression on the mind, while that in Fig. 114 makes no impression at all, unless I call their attention to the fact that it is really there although invisible.

I can prove to them in many ways that the case of an antelope's white stern-patch is subject to the same laws. *Men have always been of a stature that made them apt to see the deer's or antelope's white brightly defined against the ground,—* and whenever the animal displayed it from a higher ridge so that it had the *sky* behind it, it was nearly or quite invisible to them, and so made little or no impression on their minds.

We will assume, however, that man's eyes, being normally five or six feet above the plain, commonly perceive this white when it is displayed within their field of vision. But coyotes', wolves', and cougars' eyes are all *below* the level of this rear-patch, and just as commonly see it against the *sky* as man sees it against the ground. Beyond all dispute it is exactly the color *not* to show to the eyes of any of these predators. Equally wrong-colored is it for the sight of the fawn (so often said to have it for a guide), as well as for the adults when their heads are down in the act of grazing. How can naturalists believe that nature would give this 'signal' a color that failed to succor the most helpless members of the wearer's race, the young? *If any naturalist will once look at such white from the fawn's level in the night,*¹ he will see the absurdity of the old conception.

We all agree that whenever the antelope flashes this mark it is a sign of alarm. If it is, it must serve as a warning *to all antelopes that see it*, exactly as naturalists now believe. It must put all the antelopes that see it on the alert. There are, however, a number of other forms of signalling that obviously outrank it in serviceability. This white rear is, even when seen against the ground, only visible from *one* direction. The upraised head of an antelope watchful and sniffing stands almost as high again, and against the sky always shows dark, while its gesture always betrays to kindred animals its emotion. So must the characteristic

¹ The experimenter will find that even out in the open field it is only when the white surface faces more or less upward that it gets enough illumination to be as bright as the sky and becomes indistinguishable. Whenever the sky is partly hidden by trees the white gets too little light to match it. But while it often fails to be *bright enough* to disappear, practically never anywhere in the night is it *too bright*. It is at the moment when the white rear of the antelope, deer, or hare faces most *upward*, at the highest part of his leap, and when his head is descending, that the best 'obliteration' comes.

alarm-sounds of the species. While the high head *shows from all directions*, and nearly twice as far, and in the open always dark against bright sky, this famous 'blazon' is never in sight but from one direction at a time, and even from there no fawn or any member of the herd that chances to have its head lowered as in grazing will often see it against anything but sky. Add to this that the signal only tells of danger perceived by the signaller, and generally concerning *him* the most. Lastly, this discussion is all about *day-time* signalling, and these ruminants are then in their least danger.

Now I beg attention once more to what I believe to be the cardinal use of this white. At night, when these animals are stalked, the stalker as we all believe, creeps as *low* as possible (presumably so as not to show against the sky). The nearer he gets the surer is the deer's first bound to bring his rear-white against the sky. In short, to get near enough to seize the deer or antelope means for the predator to be so situated that the white patch (like one's hand held before one's eyes, which though only four inches wide covers the entire landscape) blots out the whole deer, putting in his place an imitation of sky.

Nothing but *actual personal experimenting* such as I myself have done will bring home this wonderful fact to naturalists. No more miraculous safety-provision could be dreamt of. And if it is the magical thing I show it to be, and always comes into play at the animal's life-and-death moments, could it fail to come into automatic operation whenever the slightest stimulus to fear reached the animal's brain? Does there remain any ground whatever to consider that it exists *for signalling*?

It will soon be perceived that the world of terrestrial animals, both mammals and birds, are furnished with this top-white in very apparent proportion to their need of not showing against the sky:—grubbing predatory mammals and ground-feeding predatory birds having it in front, and the rest wearing it behind, exactly where it does them the same *obliterative* service that it does the antelope.

Tennis players know that they play their best game while the balls are clean and show white against the dark ground. And the same principle is observed by 'squash' players, who reverse the thing — using dark balls against a light background. How could these close-lying animals that must bound away at the last moment fail to develop a coloration that made them the worst of targets for their stalkers? Surely it is what most *directly* saves their lives that is of the very most account to them.

ABBOTT H. THAYER, *Monadnock, N. H.*

RECENT LITERATURE.

Eaton's 'Birds of New York.'¹—No comprehensive work on the birds of New York has been published since the appearance of DeKay's quarto in 1844 and therefore, Memoir 12 of the State Museum (New York State Education Department) promises to be a most welcome contribution to the ornithology of the Empire State, judging by the first volume, which has just come to hand.

Mr. Elon Howard Eaton, who has spent five or six years in gathering and arranging the data, is to be congratulated on the results embodied in this first part, which covers the Water Fowl, the Game Birds and the Pigeons. The number of species accredited to the State has increased from 301 to 411 in the sixty-four intervening years and two heavy quartos take the place of DeKay's single volume. The opening chapter is a 'Summary of the New York State Avifauna,' the birds being classified in groups of 'residents,' 'summer residents,' 'transients,' 'winter visitants,' 'summer visitants,' and 'accidental visitants.' Then follows a chapter on the 'Life Zones of New York State,' accompanied by maps showing the distribution of some thirty species of the land birds and a table illustrating by a graphical method the relative zonal abundance of all of the birds of the State. The photographic maps are perhaps superior to anything yet published in a work of this character, being shaded to show elevation and with the distribution indicated by oblique red lines, but it is to be regretted that the lettering is so indistinct as to be well-nigh illegible. Those of us weak in geography would have liked besides a map showing the localities cited. There are also preliminary chapters on 'The Mt. Marcy Region,' 'The Increase and Decrease of Species,' 'Suggestions to Bird Students,' 'Bird Migration,' 'Spring Arrivals,' 'Published Local Lists,' 'County Schedules,' and 'Classification.' The remaining half of the text is given up to the birds of the State arranged in systematic order, every species being concisely described, and concerning many of them is found also a wealth of original information, classified under the headings 'Field Marks,' 'Distribution,' 'Migrations,' 'Haunts and Habits,' 'Nest and Eggs,' 'Food,' and some others. Forty-two colored plates, by Mr. L. A. Fuertes, conclude the volume.

Mr. Eaton has followed the A. O. U. Check-List in classification and in scientific names, but in the use of vernacular names he has yielded to the modern fad of discarding capitals and suppressing the possessive case.

¹ Birds of New York. By Elon Howard Eaton.—Memoir 12, New York State Museum. John M. Clarke, Director. Part I. Introductory Chapters; Water Birds and Game Birds. 4to, pp. 501 (facing leaves to plates numbered as pages; 148 pp. of tabular matter, unpagged, between pp. 86 and 87), 42 colored plates, and numerous, half-tone illustrations in the text. Albany: University of the State of New York, 1910.

In birds called 'Wilson thrush' and 'Wood thrush,' for instance it would be quite reasonable to suppose both were named after persons, and where we find 'South Bay, L. I.' 'Shinnecock bay,' 'Gardiners island, L. I.,' 'East river,' 'Lewis co.,' 'Montauk Point,' 'Onondaga lake,' 'Black-throated blue warbler,' 'Long-billed marsh wren,' and so on, we may well wonder why capitals are used at all. These are, however, rather trivial matters and in no wise impair the excellence of Mr. Eaton's work the thoroughness of which is manifested in many ways. His descriptions are good, his compilations of records are well done, and his many comparative tables of spring arrivals and of analysis in parallel columns of the species of different local lists are excellent. It is rather unfortunate, though, to have had these voluminous tables printed on one side only of the sheets, for it has resulted in a solid half inch thickness of unnumbered pages, that are a sort of huge typographical Sahara wherein one wanders about seeking the oases of information. Added to the difficulty of finding one's way we are confronted by a host of unfamiliar abbreviations which are explained only at the top of Section 1, part 1. This necessitates too much thumbing of pages with fingers stuck in to keep the place, and it is a pity we could not find at the bottom of every page the meaning of such mystic symbols as 'c, fc,' 'unc,' 'ab,' 'oc,' 'tv, vv,' etc. For the convenience of those who use the tables it may also be stated that the migration lists are not numbered at all while the local list analysis sheets are arranged so that Section 1, parts 1-15, includes species from Holboell's Grebe to the White-faced Glossy Ibis; Section 2, parts 1-18, continues the list to the Short-eared Owl; Section 3, parts 1-21, carries it to the Cardinal; and Section 4, parts 1-21, completes it.

Mr. Eaton has introduced the feature of giving the pronunciation and derivation of the Latin names, and the few slips noted are probably not his fault. Coues in his early 'Keys' correctly explained the *aquilus* of *Tachypetes aquilus* as an adjective, meaning "swarthy," but later when, with the feminine generic name *Fregata* it became *aquila*, he erred in introducing the idea of "eagle," which now reappears at p. 176. The *tympanum* of *Tympanuchus* at p. 376, means a drum rather than a "membrane," and at p. 316 is a misprint for *ἱμανρόπους*. On page 76, George N. Lawrence's paper is wrongly cited, both as to title and source. It was a 'Catalogue' published in the 'Annals' of the New York Lyceum of Natural History of New York, but as a rule there is little need for corrections as one turns the pages.

The printing of the volume is good and the type well chosen and clear. The coated paper, however, makes the book weigh like lead, and it is particularly vulnerable to the ravages of time, so that DeKay's quarto is likely to outlast its successor; and we believe that the photo half-tones scattered through the pages would have appeared to better advantage as separate plates.

The colored plates are faithful and often beautiful portraits of the species, and some of the bits of landscape are charming, but taken as a whole there

is something disappointing in them. Aside from the crowding of several species on the same plate, and the numerous different reductions from the natural size of the birds, details for which the artist cannot be held responsible, there is also something wrong with the perspective. The birds are apparently too large for the landscapes or, to put it the other way, the landscapes are too small for the birds, as the human eye really sees them under ordinary conditions in nature. With our faces to the ground within a few inches of a Woodcock, he no doubt would look like plate 31, and the landscape of plate 2 would appear lovely if a group of Loons were not swimming on the very tips of our noses. Compare these compositions with the charming Pintails of plate 15, or the Hooded Mergansers of plate 11, where the disproportion of birds and landscapes is reduced to a minimum and every stroke of the artist's brush is pleasing. Bird artists of late years have been made victims of the popular demand for pictures showing birds as well as their surroundings at the same time and personally the reviewer is of the opinion that this combination is rarely successful and that the plates of long ago when devoid of background are more dignified and effective than any of the modern efforts to combine in one picture things that are really incompatible.—J. D., Jr.

Godman's Monograph of the Petrels.¹—Part V, published in May, 1910, brings to a close the most important and one of the most needed ornithological monographs of recent years, and we heartily congratulate the author on the successful completion of this great undertaking. As stated in the Preface, for many years the author's colleague, Osbert Salvin, was engaged in amassing a large and valuable series of specimens of Petrels from all available sources, with the intention, "on the completion of the 'Tubinares' for the twenty-fifth volume of the Catalogue of Birds in the British Museum, to write a fuller account of the Petrels, and publish it as a Monograph, illustrated by coloured figures of each species; for that purpose we had some forty plates prepared by Mr. Keulemans, but Salvin's untimely death, in June, 1898, put an end to this project." Although the work was delayed for many years, in consequence of Mr. Godman's occupation with the completion of the 'Biologia Centrali-Americana,' the preparation of the plates was continued, and on the completion of that immense undertaking he turned again to this long-projected Monograph,

¹ A | Monograph | of the | Petrels | (Order Tubinares) | By | Frederick Du Cane Godman | D. C. L. F. R. S. | President of the British Ornithologists' Union | With hand-colored Plates | by J. G. Keulemans | Witherby & Co. | 326 High Holborn London | 1907-1910 — One Vol., large 4to, pp. (v + 381, 106 colored plates. Issued in 5 parts: Part I, December, 1907; Part II, March, 1908; Part III, September, 1908; Part IV, April, 1909; Part V, May, 1910. Edition, 225 numbered copies. Subscription price, £2 5s. per part, or £10 10s. for the whole work, if paid in advance.

For previous notices in 'The Auk' see Vol. XXV, 1908, pp. 244, 338; Vol. XXVI, 1909, pp. 95, 223.

and, he adds, "with the able assistance of Dr. R. Bowdler Sharpe," he no longer hesitated to make a commencement. The work has been carried out on the lines projected by Salvin, and conforms in classification, with slight alterations, to Salvin's Catalogue of the Petrels in the British Museum Catalogue of Birds. His collaborator, Dr. Sharpe, "lived to see the practical conclusion of the Monograph and to revise the proofs of all but the last few pages."

The concluding Part V treats of the Diving Petrels (genus *Pelecanoides*) and the Albatrosses, which number 19 species, referred to the three genera *Diomedea*, *Thalassogeron*, and *Phaethria*,—perhaps the most interesting and in some respects the most difficult group of species to deal with in the whole order Tubinares. As in previous parts, the treatment is technical, historical and biographical, not only the history of each form being given, but also a summary of its life history and distribution, so far as these are known. This part also includes, besides the index and introduction to the whole work, a contribution by W. P. Pycraft 'On the Systematic Position of the Petrels' (pp. xv-xxi), and the 'Classification' (pp. xxxiii-lv), containing the diagnoses of the genera and higher groups, and keys to the species. The number of species recognized is 124, of which 104 are figured. The three largest genera are *Oceanodroma* with 13 species, *Puffinus* with 25, and *Estrelata* with 32. As the nomenclature is strictly binomial, 'species' here means forms, many of which are apparently reducible to subspecies. The reader may be assured, however, that he will find here the substance of what is known of their status and relationships, given with full references to the original sources of information. It is almost needless to add that the plates are excellent, and that the letter press and general execution are of the high standard well-known to characterize the works of the publishers, Witherby and Co.—J. A. A.

Coward's 'The Vertebrate Fauna of Cheshire.'—This work, in two octavo volumes,¹ adds another excellent monograph to the long list of recent contributions to a detailed knowledge of the fauna of the British Islands. Its scope is the whole vertebrate fauna of Cheshire, a county in the north-west of England, bounded on the west by Liverpool Bay and the estuaries

¹ The | Vertebrate Fauna of Cheshire | and Liverpool Bay | Edited by | T. A. Coward, F. Z. S. | Author of "Picturesque Cheshire." | In two Volumes | . . . | With illustrations from photographs by | Thomas Baddeley | Witherby & Co. | 326 High Holborn | London | 1910.—2 vols. 8vo, 26s. net.

[Vol. I.] The Mammals and Birds of Cheshire | By | T. A. Coward and C. Oldham, F. Z. S., M. B. O. U. | Authors of the "Birds of Cheshire" | — Pp. xxxii + 472, 34 half-tone plates.

[Vol. II.] The Dee as a Wildfowl Resort | By John A. Dockray | — | The Reptiles and Amphibians of Cheshire | By T. A. Coward and C. Oldham, F. Z. S., M. B. O. U. | Authors of 'The Birds of Cheshire' | — | The Fishes of Cheshire and Liverpool Bay | By James Johnstone, B. Sc. (Lond.) | Author of "British Fisheries" and "Conditions of Life in the Sea" | Pp. xl + 210, 14 half-tone plates, text illustrations, and map.

of the Dee and Mersey. The extent of the area treated is a little more than one thousand square miles, the greater part of which consists of an undulating plain, ranging in elevation from about 100 to 300 feet, with ridges along the eastern border that attain altitudes of 1650 to about 1900 feet. There are marshy tracts between the estuaries of the Mersey and the Dee, giving considerable diversity to the area as a whole.

The introduction (pp. xi-xxii), besides describing the topography and faunal aspects of the county, summarizes the literature of the subject, and the influence of game preservation, which, "direct and indirect, . . . is great and far-reaching." "Incessant war is waged against predatory mammals and birds, whilst other creatures inimical to game and often of benefit to the agriculturist, are destroyed by biassed and indiscriminating game-keepers. . . . Any creature, therefore, against which there is even traditional suspicion is under their ban." The raptorial birds and mammals have suffered to such an extent that the polecat, marten and otter have become extinct, several of the larger birds of prey are becoming rare or have long since vanished, while the "Magpie, Carrion Crow and Jay are in some districts almost extinct." On the other hand, their destruction contributes materially to the welfare of many passerine birds, as does the preservation of fox and pheasant coverts.

Forty-six species of mammals are recorded (pp. 1-89) as having occurred "within recent years in Cheshire and its territorial waters." The birds, of which "there is satisfactory evidence of their occurrence in a wild state during the present and last centuries," number 231 species (pp. 93-459). Cheshire "lies remote from the great highways of migration, and consequently its avifauna is poor in regard to many of the species which occur frequently on the shores of such counties as Yorkshire, Norfolk, Kent and Sussex."

The nomenclature is that of Howard Saunders's 'Manual of British Birds,' as revised by him in 1907, except that trinomials are used for British races, since "the trinomial system of nomenclature, . . . in addition to other advantages, shows plainly the real affinities of the local races or subspecies." The method of treatment consists in giving the commonly accepted English and technical names of each species, followed by its local names, and a summary statement (in a line or two of small heavy-face type) of its manner of occurrence in Cheshire. No references are given to previous works, general or local, nor any description of the species, these being readily available in numerous recent manuals of British birds. The text is thus mainly biographical, and varies in amount for the commoner resident and breeding species from one to several pages; to the rarer ones less space is given, with references in footnotes to previous records of occurrence.

In addition to the bird matter contained in Volume I, there is an interestingly reminiscent chapter in Volume II (pp. xxi-xl) on 'The Dee as a Wildfowl Resort,' by John A. Dockray. The remainder of Volume II is devoted to the Reptiles (5 species), Amphibians (6 species) and Fishes, the

latter occupying the greater part of the volume, which closes with about thirty pages of bibliography and an index.

Although so many works, general and local, have been published in recent years on the vertebrate animals of the British Islands, there is still room for many more, if of the trustworthy class of this excellent summary of 'The Vertebrate Fauna of Cheshire.' — J. A. A.

The Beebe's 'Our Search for a Wilderness.'¹ — We have rarely had the opportunity to read a book of travel so charmingly written or so full of interest as Mr. and Mrs. Beebe's 'Our Search for a Wilderness. It is "the tale of two searches for a wilderness," the first, undertaken in the early part of 1908, was to the country about the Venezuelan Pitch Lake, La Brea; the other, made in the early part of 1909, was to British Guiana, where three excursions were made from Georgetown into the "wilderness." In neither "search" were their travels into the interior very extended, but they succeeded in each instance in reaching a nearly virgin wilderness, where animal and plant life was found in tropical luxuriance, unchanged to any material extent by the hand of man. Their trips into the interior were by water routes, by a small sloop or with a canoe and Indians.

The first hundred and ten pages deal with the Venezuela trip, made from Port of Spain, Trinidad, up the Caño San Juan to the Pitch Lake, sailing and paddling for days "through a land of mangroves and water, where, with the exception of two tiny muddy islets in the forest, there was no solid ground." At last "real earth" was reached, and the foothills of the northern Andes were seen beyond La Brea, the latter in the heart of the forest. "We were at the village of Guanoco, the shipping point of the pitch lake. A few steps beyond the last hut and one was in the primeval forest — so limited is man's influence in this region of rapidly growing plants." With this point as a base, several weeks were spent in exploring the neighboring forests, rich in tropical life and in new experiences for our travellers. This part of the book consists of three chapters, the first, entitled 'The Land of a Single Tree' (the mangrove); the second, 'The Lake of Pitch'; the third, 'A Woman's Experiences in Venezuela', written by Mrs. Beebe. The other two, as is a large part of the book, are written jointly by both authors.

Part II relates to British Guiana, and occupies about three fourths of the volume. The first chapter is devoted to Georgetown, the next two to a steamer and launch trip to Hoorie Creek, and thence a few miles by cart to "a gold mine in the wilderness." Then follows an account of a canoe

¹ Our Search for a | Wilderness | An Account of two ornithological Expeditions | to Venezuela and to British Guiana. | By | Mary Blair Beebe | and | C. William Beebe | Curator of Ornithology in the New York Zoological Park; | [etc. = 4 lines of titles] Illustrated with Photographs from Life | taken by the Authors | [colophon] | New York | Henry Holt and Company | 1910 — 8vo, pp. xix + 408, frontispiece and 160 half-tone text illustrations, many of them full-page. Published April, 1910.

trip with Indians through the "coastal wilderness," via little-known rivers and creeks. Two chapters are given to jungle life on Aremu River, the locality of the gold mine already mentioned. A concluding chapter is devoted to the coast savannas, under the title, 'The Life of the Abary Savannas.' Supplemental matter in appendices is a classified list of the birds observed, the 161 species being numbered and referred to in the text only by their vernacular names with a reference by numbers to the list, in lieu of burdening the text with the frequent repetition of technical names. There is also a list of native Guianan names of birds, and a list of the moths and some other insects collected in Guiana, "as far as they had been determined" when the book was sent to press. The principal ornithological results of the trip to Venezuela have been set forth in two special papers entitled respectively, 'A Contribution to the Ecology of the Adult Hoatzin,' and 'An Ornithological Reconnaissance of Northeastern Venezuela,' published late in December, 1909.¹

Mr. Beebe was accompanied on his Guiana trip by Mr. Lee S. Crandall of the New York Zoölogical Park, by whose aid nearly three hundred living birds were brought back to the Park, representing fifty-one species, besides many small mammals and reptiles, mostly new to the collection.

Mr. and Mrs. Beebe are both, temperamentally and otherwise, well fitted for exploration in tropical forests and jungles; that they are enthusiasts in this line of field work, and well-equipped for making good use of their opportunities, is evidenced not only by their 'Our Search for a Wilderness,' but by their earlier 'Two Bird Lovers in Mexico,' with which doubtless many readers of 'The Auk' are already familiar. But the later work far excels the former one in interest, as regards both the scenes visited and the information conveyed. The tale is simply and enthusiastically, and hence fascinatingly, related, and contains much that is wholly new or reported from a new view point. Their keen interest and admiration seem to have been almost equally awakened by all forms of invertebrate as well as vertebrate life, and by plant life as well, and they appear to have been constantly impressed by the abundant examples of "protective form or coloration" met with at every turn. The profusion of excellent illustrations add greatly to the value and interest of this exceedingly attractive book.—J. A. A.

Festa's 'In Darien and in Ecuador.'²—Dr. Enrico Festa left Italy early in 1895 on a natural history expedition to Ecuador, but owing to a revolution then in progress in that country was obliged to wait for some months for the return of more favorable conditions, in the meantime spending several months in exploration in Darien. He thus arrived at Guaya-

¹ See *antea*, pp. 227, 228.

² Dr. E. Festa | *Nel Darien | e nell' Ecuador* | *Diario di viaggio | di un naturalista* | 1909 | Unione | Tip.-Editrice | Torinese | Corso Raffaello, 28 | Torino — Svo, pp. xvi + 397, with 2 maps and about 75 half-tone plates. Lire 10.

quail late in September, 1895, and travelled and collected in Ecuador till about the end of February, 1898, when he returned to Europe. His work was mainly in the Andean region, which he traversed from Cuenca to beyond Tulcan. He made extensive collections in all departments of zoölogy, but especially of mammals, birds, reptiles, and fishes. From the summary of the 'Zoölogical Results' given at the end of the volume, it appears that a large part of the mammals and much of the invertebrate material still remains unpublished. The birds were promptly worked out and published in coöperation with Professor Salvadori,¹ the collection of Ecuador birds alone numbering nearly 3000 specimens and 613 species, of which 17 proved to be new. The present volume, as the title shows, is the author's diary of his explorations, and contains much of general interest concerning the countries visited and their people, especially the Indians and their antiquities, besides the wide range of natural history notes one would expect to find in the diary of a naturalist engaged in exploration. The numerous half-tone plates give views of characteristic Andean and other scenery, and of the natives, their habitations, utensils, weapons, and ornaments. Only the first 53 pages are devoted to Darien, where the author spent only a few months of his three years of exploration in Central and South America. Although the text abounds in references to the birds and other forms of animal life, there is unfortunately no index to enable one to turn readily to the information here so abundantly recorded. — J. A. A.

Thoreau's 'Notes on New England Birds.'—Mr. Francis H. Allen has brought together in a handy volume, published by the Houghton Mifflin Company,² the notes on birds scattered through the fourteen volumes of Thoreau's published 'Journal', "in the belief that readers and students would be glad to have these bird notes arranged systematically in a single volume." The editor has thus earned the gratitude of bird lovers and of the many admirers of Thoreau's quaint and often poetic manner of recording his observations and interpretations of nature. These bird notes were jotted down in Thoreau's diaries mainly between the years 1850 to 1860, with a few of later date and some written as early as 1842. Thoreau was a keen observer, and had much to record about many species, and though not an ornithologist, and sometimes mistaken in his identifications, being autoptically acquainted with very few species, his records have value as covering a period when ornithological observers were few, and the means of identification scanty in comparison with the profusion of hand-

¹ Noticed in *The Auk*, Vol. XVI, 1899, p. 292; Vol. XV, 1900, pp. 81, 303.

² Notes on | New England Birds | By | Henry D. Thoreau | arranged and edited | by | Francis H. Allen | With Illustrations from Photographs | of Birds from Nature | [colophon] | Boston and New York | Houghton Mifflin Company | The Riverside Press, Cambridge | 1910 — 12mo, pp. xiv + 452, 8 half-tone plates, and map of Concord, Mass., May, 1910. \$1.75 net.

books and local collections available to present day bird lovers. In this republication of Thoreau's bird notes the original author of them is most fortunate in having the work fall to the lot of an editor and commentator so sympathetic, intelligent, and painstaking. The 'notes' are of course fragmentary, but when brought together chronologically form a considerable amount of text about each of the more common species of the 'Concord region', where Thoreau lived, made surveys, walked in the woods and fields, and made daily note of what he saw and experienced.

The present volume is made up exclusively of excerpts from the 'Journal,' but the editor has given in an Appendix an index to the bird matter contained in Thoreau's other works, so that within the present volume are given not only the passages contained in the 'Journal' but an index to all of Thoreau's other ornithological references, these amounting, it is stated, "to less than one twelfth as much as that contained in the 'Journal'." A map of Concord, compiled by Herbert W. Gleason, shows the localities mentioned by Thoreau in his Journals, and is based in part on Thoreau's own surveys. This map is furnished with an index, thus greatly facilitating its use in reading the 'Notes,' and furnishing pilgrims to the haunts of Thoreau with the means of locating and identifying his favorite resorts.—J. A. A.

Ridgway on New Forms of Swifts and Hummingbirds.¹—In this paper Mr. Ridgway describes a new species of *Chaetura* (*C. richmondi*) from Costa Rica, a new subspecies of *Streptoprocne* from Mexico, and two new subspecies of *Cypseloides niger*, respectively from Costa Rica and Jamaica; also a new species and five new subspecies of Hummingbirds, mostly from Mexico and Costa Rica. A new genus *Nesophlox* is proposed, with *Trochilus evelynæ* Bourcier as the type.—J. A. A.

Swarth on Two New Owls from Arizona.²—The first of the two new subspecies here described is *Otus asio gilmani*, nearly related to *O. a. cineraceus*, but described as paler and smaller, and as occupying a different life zone, it inhabiting "the giant cactus country, valleys and mesas which are subject to extremes of heat and aridity, while *cineraceus* is at home along the shaded cañon streams and on densely timbered hillsides." The other is a subspecies of the Spotted Owl, and is named *Strix occidentalis huachucae*, described from a single specimen from the Huachuca Mountains of Arizona, and as differing from true *S. occidentalis* in being paler and smaller. The juvenal plumage of the latter is here described for the first time from two specimens taken near Pasadena, California, both from the same brood and just able to fly when captured.—J. A. A.

¹ Diagnoses of new forms of Micropodidae and Trochilidae. By Robert Ridgway. Proc. Biol. Soc. Washington, Vol. XXIII, pp. 53-56, April 19, 1910.

² Two New Owls from Arizona, with Description of the Juvenal Plumage of *Strix occidentalis occidentalis* (Xantus). By Harry S. Swarth. University of California Publications in Zoology, Vol. VII, No. 1, pp. 1-8. May 26, 1910.

Mailliard on the Redwings of California.¹—The old question of the relationship of the *Agelaius gubernator* group to the *A. phæniceus* group of Redwinged Blackbirds is again here discussed by Mr. Joseph Mailliard, and the conclusion reached that "*gubernator* is directly connected with *phæniceus* and that *A. gubernator californicus* is rightly *A. phæniceus californicus*." This conclusion is based on a detailed study of a large amount of material from different parts of California, including a large series of specimens collected from a breeding colony in Stanislaus County. His paper is illustrated with photographs to show the variation in the amount of streaking on the ventral surface of a series of females, and the amount of black tipping the middle wing coverts of males, and by an extensive table of measurements of *A. gubernator californicus* and *A. phæniceus neutralis*; showing that neither size nor other alleged characters suffice sharply to separate these two forms, and that their real relationship is that of subspecies of *A. phæniceus*. The view here expressed is in harmony with that held by Coues in 1872 to 1884, and by Ridgway in 1874 to 1880, and by other good authorities of that period, and Mr. Mailliard's new evidence seems to point strongly to the conclusion that these 'lumpers' of earlier days were, at least in this instance, not far from right in their treatment of these forms.—J. A. A.

Clark on Birds Collected or Observed in the North Pacific Ocean and adjacent Seas.²—During the cruise of the United States Fisheries Steamer 'Albatross,' in the North Pacific Ocean and in the Bering, Okhotsk, and Japan Seas and adjoining waters, for the investigation of fish and marine invertebrates, Dr. Clark, the author of the present report on the birds collected or observed on the cruise, was able, in addition to his work on fishes and marine invertebrates as the representative of the Fisheries Bureau, to devote considerable attention to the birds met with. In addition to the 180 specimens brought home as skins, many more were studied in the flesh or observed in life. The notes and the specimens taken during the trip form the basis of the present report, which comprises notes on about 175 species, nearly equally divided between water birds and land birds. Observations began with the departure of the 'Albatross,' May 3, from San Francisco, and were continued until the steamer again dropped anchor at San Francisco, December 10.

The author was able to spend a day or two on shore at Dockton, Wash-

¹ The Status of the California Bi-colored Blackbird. By Joseph Mailliard. Condor, March, 1910, pp. 63-70, figs. 22, 23, from photographs by the author.

² The Birds collected and observed during the Cruise of the United States Fisheries Steamer "Albatross" in the North Pacific Ocean, and in the Bering, Okhotsk, Japan, and Eastern Seas, from April to December, 1906. By Austin Hobart Clark, Assistant Curator, Division of Marine Invertebrates, U. S. National Museum. Proc. U. S. Nat. Mus., Vol. XXXVIII, No. 1727, pp. 25-74. Published April 30, 1910.

ington, at Union Bay,* Vancouver Island, at some of the Aleutian Islands, a few hours at Copper Island and Bering Island, with short halts at various points along the Japanese and Kamchatkan coasts. The list contains important notes on many of the species, as the Puffins, Auklets, Guillemots, and other sea birds met with along the American coast, in the Aleutian Archipelago, in the Kuril Islands, and along the coast of Kamchatka. The only Point Barrow Gull seen was observed in Patience Bay, Sakhalin, while the Vega Gull "was rather common in Unalga Pass, near Unalaska," and was seen again, in small numbers, in Avacha Bay, Kamchatka. There are also interesting notes on the Albatrosses, the Pacific Fulmar, and the various species of Petrel observed. The Kamchatkan Sea Eagle (*Thrasaetus pelagicus*) is recorded as seen near the town of Unalaska, but unfortunately was not obtained. So sure is Dr. Clark of its identification that he says: "A thorough survey of these [Aleutian] islands may show that this species, as well as *Haliaetus albicilla*, which has been recently recorded from Unalaska, are of more or less regular occurrence throughout the whole group."

Under *Lagopus lagopus alexandrae* are several pages of critical notes on Ptarmigans, with figures of bills of three forms of the *L. lagopus* group, and a key to the American subspecies of *Lagopus lagopus*, three being recognized, as follows: (1) *L. l. alleni*, Newfoundland; (2) *L. l. albus* (Gmelin), inhabiting "northern Labrador, westward and northward to northern Alaska, reaching Point Barrow, Kotzebue Sound, Cape Lisbourne, and Kowak River (type locality, Hudson Bay)"; (3) *L. l. alexandrae*, "southern Alaska, from coasts of Norton Sound and Alaska Peninsula, including Kadiak and Shumagin islands, southeastward to mountains of southeastern Alaska."

The paper as a whole contains much interesting information about a large number of species, particularly the pelagic forms and those breeding at the various northern islands visited. The cruise afforded rare opportunities for ornithological observation, and they seem to have been well utilized.—J. A. A.

Clark on Birds collected by P. L. Jouy in Korea.¹—The late Pierre Louis Jouy spent over three years (between 1881 and 1886) in Korea, and at the time of his untimely death in 1894 was engaged in the preparation of a report on the ornithological collection made by him in that country, numbering 554 specimens, and representing, according to Dr. Clark's present account, about 165 species. In 1907 Dr. Clark published a considerable number of new species from Jouy's collection,² and incidental

¹ Report on a Collection of Birds made by Pierre Louis Jouy in Korea. By Austin F. Clark, Assistant Curator, Division of Marine Invertebrates, U. S. National Museum. Proc. U. S. Nat. Mus., Vol. XXXVIII, No. 1735, pp. 147-176. Published May 9, 1910.

² For a review of this paper see Auk, Vol. XXIV, 1907, p. 453.

use has been made of it by others, including Dr. Clark in the preparation of his report on the birds of the 'Albatross' cruise of 1906 (reviewed above), but no full report upon it has been published until now. In the meantime some of the birds first obtained in Korea by Jouy have already been recorded by others, and in order to secure to him the proper results of his labors this report is now offered in its present, as the author states, not wholly satisfactory form. It is, however, the most important contribution yet made relating distinctively to Korean ornithology.—J. A. A.

Walter's 'Wild Birds in City Parks.'—The fourth revised and enlarged edition of this "handy pocket guide to the birds"¹ has been greatly extended since our notice of the first revised edition in 1903 (Auk, XX, p. 316), the number of species treated having been increased from 100 to 200, the amount of matter more than doubled, and the table of comparative distribution greatly extended, it now covering the northern tier of States from Maine to Illinois and Missouri. The note to the present edition states that the entire subject has been thoroughly revised, "with the end in view of making the book useful in all localities in northeastern United States from the Mississippi to the Atlantic coast." That the book has proved useful is to be inferred from the statement that the present printing is the "eighteenth thousand."—J. A. A.

Collinge on Food Habits of the Rook.²—This investigation, which has been carried on more like similar studies in the United States than any other European work on economic ornithology we can recall, is based on the examination of 830 stomachs of Rooks, collected at all seasons in 41 counties of England and Wales. The bulk of the food taken from these gizzards was grain, chiefly wheat. A comparatively small amount of weed seeds was present, and much acorn mast, some gooseberries, currants, grass roots and potatoes complete the list of vegetable foods. Animal food averaged in the 12 months only 15 per cent. of the total food contents of the gizzards. The proportion varied from 1 per cent. in January to 40 per cent. in July. Beetles, their larvæ, and caterpillars were the principal items. Remains of the following vertebrates were found: long-tailed field mice (*Mus sylvaticus*), rat (?), rabbit, and young birds, including blackbirds. Blackbirds' and pheasants' eggs were taken from 1 and 5 stomachs, respectively. From these details it is evident that the Rook

¹ Wild Birds in City Parks. Being hints on identifying 200 birds, prepared primarily for the spring migration in Lincoln Park, Chicago, but adapted to other localities. By Herbert Eugene Walter and Alice Hall Walter. Fourth enlarged Revision, with Chart and Key, Author's Edition. 1910. 16mo, pp. 92. Single copies, 35 cents; packages of ten, \$2.50.

² Collinge, W. E. The Feeding Habits of the Rook (*Corvus frugilegus*, Linn.). Rep. to the council of the Land Agents' Society, April 1, 1910. Pp. 1 to 23. London.

gets its living in much the same way as the American Crow. The similarity is further evident in a marked preference for scarabæid and carabid beetles. A most remarkable difference in food habits is the almost total absence of orthoptera from the diet of the Rook. Neither grasshoppers nor crickets are mentioned in this paper nor in the two reports mentioned below, while these insects compose a large proportion of the food of the American Crow and are a great favorite with most ground feeding birds of the United States.

The author concludes that "so far as the evidence of this inquiry shows, the rook is not a particularly beneficial bird to the agriculturist, although its usefulness might be considerably increased were it fewer in numbers." This opinion agrees with that of John Gilmour¹ on the Rooks of Fifeshire, which was based on an examination of 355 gizzards. In view of the same conclusion being reached in two extensive investigations, one local, the other general, there is little doubt that it accurately sets forth the economic status of the Rook in Great Britain.

A more favorable opinion of the Rook is held in Germany, Hollrun² stating that the harm done by the birds in April, May and June is considerably outweighed by useful services. The proportion of animal matter in the 131 stomachs collected in these months was 66 percent., almost 2½ times the percentage found in English Rooks during the same period.—W. L. M.

Finn's 'The Waterfowl of India and Asia.'—This is a revised edition,³ under a new name, of "How to Know the Indian Ducks," amplified by the inclusion of all the Asiatic species of the family. Forty-two species, including stragglers, are recorded from India alone, and the heads of half of this number are illustrated by good figures.

The biographies are full and interesting and much attention is given to the differences between the closely related species and also to the characters of the higher groups. As a further aid in identification two synoptical tables are added. The lack of an alphabetical index will be a source of inconvenience to the users of this otherwise handy little work.—W. De W. M.

Publications Received.—Allen, Francis H. Notes on New England Ornithology, by Henry D. Thoreau, arranged and edited by Francis H. Allen. 12mo, Houghton Mifflin Co., Boston and New York, May, 1910. \$1.75 net.

¹ Trans. Highland and Agr. Soc. of Scotland, 5th ser., Vol. VIII, pp. 21–113, 1896.

² 7ter Jahresbericht Versuchstation f. Pflanzenschutz zu Halle, pp. 5–26, 1895.

³ The Water Fowl of India and Asia | By | Frank Finn, B. A. (Oxon), F. Z. S., M. B. O. U., | Late Deputy Superintendent of the Indian Museum, | Author of | "Garden and Aviary Birds of India," | . . . 4 lines of titles of author's previous works | — | Calcutta: Thacker, Spink & Co. | — | 1909 — 12mo, pp. ix + 121, and 11 half-tone plates of heads. Price, Rs. 2–8.

Beebe, Mary Blair and C. William. Our Search for a Wilderness. 8vo, New York, Henry Hold & Co., 1910.

Clark, Austin Hobart. (1) The Birds collected and observed during the Cruise of the United States Fisheries Steamer 'Albatross' in the North Pacific Ocean, and in the Bering, Okhotsk, Japan, and Eastern Seas, from April to December, 1906. (Proc. U. S. Nat. Mus., Vol. XXXVIII, No. 1727, pp. 25-74. April 30, 1910.) (2) Report on a Collection of Birds made by Pierre Louis Jouy in Korea. (*Ibid.*, No. 1735, pp. 147-176. May 9, 1910).

Coward, T. A. The Vertebrate Fauna of Cheshire. 2 vols., 8vo. London, Witherby and Co., 1910. 26s. net.

Eaton, Elon Howard. Birds of New York. Vol. I, 4to.=Memoir 12, New York State Museum, Albany, N. Y., 1910.

Festa, E. Nell Darien e nell' Ecuador. 8vo. Torino, 1909. Lire 10.

Gallenkamp, W. Frühjahrsbesiedelung und Zugstypen in Bayern. (Verhandl. Orn. Gesells. in Bayern, IX, 1908 (1909), pp. 168-222.)

Finn, Frank. The Water Fowl of India and Asia. 12mo, Calcutta, 1909. Price, Rs. 2-8.

Godman, F. Du Cane. Monograph of the Petrels. Part V, May, 1910 (completing the work). London, Witherby & Co.

Menegaux, A. Étude d'une collection d'oiseaux provenant des haut plateaux de la Bolivie et du Pérou meridional. (Bull. Soc. Philomatique de Paris, 1909, pp. 25.)

Oldys, Henry. (1) Introduction of the Hungarian Partridge into the United States. (Yearbook Dept. Agric. for 1909, pp. 249-258, pl. xiv, colored.) (2) Pheasant Raising in the United States. U. S. Dept. Agric., Farmers' Bulletin No. 390.

Palmer, T. S. Private Game Preserves and their Future in the United States. U. S. Depart. Agric., Bureau of Biol. Surv., Circular No. 72.

Palmer, T. S., Henry Oldys, and C. E. Brewster. Progress of Game Protection in 1909. U. S. Depart. Agric., Bureau of Biol. Surv., Circular No. 73.

Parrot, C. Bericht über eine von Dr. E. Zugmayer in Chinesisch-Turkestan, Westtibet und Kaschmir zusammengesammelte Vogelsammlung. (Verhandl. Orn. Gesells. in Bayern, IX, 1908 (1909), pp. 228-266.)

Phillips, Frank J. The Dissemination of Junipers by Birds. (Forestry Quarterly, Vol. VIII, No. 1, pp. 16.)

Ridgway, Robert. Diagnoses of new forms of Micropodidae and Trochilidae. (Proc. Biol. Soc. Washington, Vol. XXIII, pp. 53-56, April 19, 1910.)

Swarth, Harry S. Two new Owls from Arizona, with description of the juvenal plumage of *Strix occidentalis occidentalis* (Xantus). (University of California Publications in Zoölogy, Vol. VII, No. 1, pp. 1-8, May 26, 1910.)

Shufeldt, R. W. (1) The Extinction of Birds in this Country. (The Outer's Book, Vol. XIX, April, 1910, pp. 343-351.) (2) Quail or no Quail?

That's the Question. (Overland Monthly, Vol. LV, April, 1910, pp. 353-356.) (3) An hitherto unpublished Painting by Audubon. (Wilson Bulletin, Vol. XXII, March, 1910, pp. 3-5.)

Van Oort, E. D. (1) On the Generic name *Passerina*. (Notes from the Leyden Museum, Vol. XXXII, 1910, p. 32.) (2) *Ardea purpurea mada-gascariensis*, nov. subsp. from Madagascar. (*Ibid.*, pp. 83, 84.) (3) List of a Collection of Birds from Western Java and from Krakatau. (*Ibid.*, pp. 105-166.) (4) *Hierofalco gyrfalco islandus* (Brünnich), a new Bird to the Avifauna of the Netherlands. *Ibid.*, p. 176.) (5) Once more the Generic Name *Passerina* Vieillot. (*Ibid.*, pp. 185, 186.)

Walter, Hubert Eugene and Alice Hall Walter. Wild Birds in City Parks. 4th enlarged revision.

Annals of Scottish Nat. Hist., No. 74, April, 1910.

Aquila, Vol. XVI, 1909.

Avicultural Magazine, (3) I, Nos. 6-8, April-June, 1910.

Bird-Lore, XII, Nos. 2, 3, April-June, 1910.

British Birds, III, Nos. 11, 12, and IV, No. 1, April-June, 1910.

Bulletin British Orn. Club, Nos. CLIX-CLXI.

Bulletin Charleston Museum, VI, Nos. 3-5, March-May, 1910.

Condor, The, XII, Nos. 2 and 3, 1910.

Emu, The, IX, Nos. 2-4, Oct., 1909-April, 1910.

Forest and Stream, LXXIV, Nos. 13-26, 1910. Nos. 2, 3, March-May, 1910.

Ibis, The, (9) IV, No. 14, April, 1910.

Journal für Orn., LVIII, April, 1910.

Journal Maine Orn. Soc., XI, Nos. 3, 4, 1909, XII, No. 1, 1910.

Messenger Ornithologique, I, Nos. 1, 2, 1910.

Ornithologische Monatsberichte, XVIII, Nos. 4-6, April-June, 1910.

Ornithologische Monatsschrift, XXXV, Nos. 2-4, Feb.-April, 1910.

Ottawa Naturalist, XXIV, Nos. 1-3, April-June, 1910.

Proceedings Acad. Nat. Sci. Philadelphia, LXI, Part 3, Oct.-Dec., 1909, LXII, Part 1, Jan.-March, 1910; Annual Reports, 1909.

Science, N. S., Nos. 795-807, 1910.

Wilson Bulletin, XXII, No. 1, March, 1910.

Zoölogical Soc. London, Abstract of Proc., Nos. 76-85, 1910.

Zoölogist, The, (4) XIV, Nos. 158-162, Feb.-June, 1910.

CORRESPONDENCE.

'Concealing Coloration.'

EDITORS OF 'THE AUK,'

Dear Sirs: — In your most gratifying review of our book, 'Concealing Coloration,' there is only one thing that I could care to amend, and that is the share in the authorship allotted to my son Gerald H. Thayer.

Being more indebted to him for writing this book than I can ever repay, and he being a professional writer, I owe it to him to make it clearly understood that while with only secondary exceptions the book's *material* is mine, yet the whole book *as a book* — its scheme and every sentence in it (except, of course, the passages signed by me, which owe much to his revision) — is entirely his. But for him I could not only never have found time and energy to produce any book at all, but could not in any literary sense have at all equalled this one.

Sincerely yours,

ABBOTT H. THAYER.

Monadnock, N. H.,
May 20, 1910.

NOTES AND NEWS.

ALEXANDER O'DRISCOLL TAYLOR, an Associate of the American Ornithologists' Union since 1888, died at his home in Newport, Rhode Island, on April 10, 1910, in the seventy-ninth year of his age, after a short illness from pneumonia. He was born in Cork, Ireland, January 2, 1832, and came to this country in 1883. He soon after became disbursing agent of the survey for the Northern Pacific Railroad, and later was connected for a time with the United States Geological Survey. He engaged in the real estate business in Newport in 1885, and for twenty-five years was active in the business, municipal, and educational interests of the city of his adoption. He was deeply interested in natural history, being a well-informed amateur in various lines, especially in ornithology. He took a very active part in the work of the Newport Natural History Society, of which he was curator in 1885-1887, secretary in 1888, and president from 1889 till his decease. He was also the head of the Rhode Island Game Commission, a devoted champion of bird protection, and did much to popularize the study of natural history. He is survived by two sons and a daughter.

THE next Stated Meeting of the American Ornithologists' Union will be held in Washington, D. C., beginning Monday, November 14, 1910, this being the date selected by the Local Committee, to whom the matter was referred by the Union.

THE new edition of the American Ornithologists' Union Check-List of North American Birds, which has been some four years in preparation, will probably be ready for distribution about the end of July. It will differ in several respects from the previous editions, both typographically and in the character of the matter. The arrangement and numeration, however, will be the same. The changes in nomenclature have already been announced in the various supplements that have been issued since the publication of the second edition in 1895, so that in this respect there will be few surprises. The 'ranges,' or the matter relating to the geographical distribution of the species and subspecies, have, however, been entirely rewritten and greatly amplified, thus fully reflecting the latest knowledge of the subject. Besides being given in greater detail and with more definiteness, they are arranged to show not only the general range of the forms, but also the breeding and winter ranges, so far as these are at present known. We hence feel sure that the vast amount of work expended in the preparation of this new edition will be greatly appreciated by future users of the Check-List, of which a more detailed analysis, and comparison with previous editions, will be given later.

An abbreviated edition of the Check-List, consisting only of the English and technical names, numbered in accordance with the numeration of the previous editions of the Check-List, is in preparation and will be issued at about the same time as the regular edition. It will be of small size, with rounded corners and flexible covers, and thus handy for the pocket, and be printed on only one side of the leaf, thereby providing convenient space for annotations.

READERS of 'The Auk' will be interested to learn that through the liberality of Mrs. E. H. Harriman an endowment has been established to provide Dr. C. Hart Merriam with a liberal income and a fund for general expenses to enable him hereafter to devote his time entirely to scientific work untrammelled by official routine. Doctor Merriam has long had in contemplation the preparation of a work on the mammals of North America, the completion of which has been delayed by pressure of official work. The establishment of this endowment makes it certain that the appearance of the first volumes of the series will not be long delayed. The resignation of Doctor Merriam as Chief of the Biological Survey took effect June 1, and Mr. H. W. Henshaw has been appointed his successor, with Dr. T. S. Palmer as Assistant Chief.

In order that the fruits of Doctor Merriam's experience and long field work may not be wholly lost to the Department, which he has served for

25 years, Doctor Merriam will still retain an official connection with the Survey under the title of Consulting Biologist.

We have the assurance that under the new regime the work of the Biological Survey will be conducted along practically the same lines as in the past.

MR. WILLIAM DUTCHER, President of the National Association of Audubon Societies, sailed on May 17 for Europe, to attend the Fifth International Ornithological Congress held in Berlin May 30 to June 4. It was his purpose to present to the Bird Protection section of the Congress a plan for an international organization for the conservation of wild bird and animal life. Mr. Dutcher was also the accredited representative of the United States Government, the Smithsonian Institution, the U. S. National Museum, and the American Ornithologists' Union to the Congress, and empowered by the latter to extend a cordial invitation to the Congress to hold its next session (in 1915) in Washington. It was decided, however, we are informed, to hold it at Serajevo, in Bosnia.

IN OUR reference to the Smithsonian Expedition to East Africa in a former issue of this journal (April, 1909, p. 220), it was said that under such a leader as Colonel Roosevelt, and with the support of such an able staff as Dr. Mearns, and Messrs. Heller and Loring, and barring accident and illness, "the results of the year's work in British East Africa . . . should be of the greatest scientific importance and bring to this country a greatly needed collection of the leading forms of the vertebrate life of a region at present poorly represented in American Museums." In recording the safe return of all the members of the party, it is gratifying to know that the most optimistic anticipations of success have been more than realized, as shown by Mr. Roosevelt's summary of results communicated to the Secretary of the Smithsonian Institution and published in the 'National Geographic Magazine' for April, 1910 (pp. 364, 369, 370). The expedition landed at Mombasa on April 21, 1909, and reached Khartoum on March 14, 1910, none of the party having experienced serious illness during their long period of tropical field work. Eight months were spent in British East Africa, the collections having been made principally on the Athi and Kapiti plains, in the Sotik, and around Lake Naivasha. Also, to quote from the report: "Messrs. Mearns and Loring made a thorough biological survey of Mount Kenia, while the rest of the party skirted its western base, went to and up the Guaso Nyero, and later visited the Uasin Geisha region and both sides of the Rift Valley. Messrs. Kermit Roosevelt and Tarlton went to the Lailsipia and Lake Harrington, and Dr. Mearns and Mr. Kermit Roosevelt made separate trips to the coast region near Mombasa." On the way down the White Nile over three weeks were spent in the Lado, and collections were also made on the Bahr el Ghazal and Bar el Zeraf. Important aid was courteously extended throughout the journey by the British and Belgian officers of the countries traversed.

During the trip "Mr. Heller has prepared 1,020 specimens of mammals, the majority of large size; Mr. Loring has prepared 3,163, and Dr. Mearns 714 — a total of 4,897 mammals. Of birds, Dr. Mearns has prepared nearly 3,100, Mr. Loring 899, and Mr. Heller about 50 — a total of about 4,000 birds. Of reptiles and batrachians, Messrs. Mearns, Loring, and Heller collected about 2,000. Of fishes, about 500 were collected. Dr. Mearns collected marine fishes near Mombasa, and fresh-water fishes elsewhere in British East Africa, and he and Cuninghame collected fishes in the White Nile." This makes a total of about 11,400 vertebrates, probably greatly exceeding the number ever taken by any expedition in the same length of time in any country. Besides this, Dr. Mearns collected several thousand plants, and, with assistance from other members of the party, considerable anthropological material and many insects, mollusks and other invertebrates.

All of these vast collections have safely reached the U. S. National Museum in Washington, where specialists are already at work upon them. It is understood that Mr. Heller will prepare the report on the mammals, and Dr. Mearns the report on the birds.

A NEW quarterly ornithological magazine, printed in the Russian language, but which may be designated in English as the 'Ornithological Messenger,' has made its appearance at Moscow, Russia, under the editorial direction of G. I. Poliakoff (address: Russia, Moscow, Leontiewsky, No. 17, 5. Annual subscription, 2.50 Rbl.). The first two numbers (1910) contain articles by such well known authorities on Russian birds as S. A. Buturlin, P. P. Suschkin, S. N. Alphéraky, N. A. Sarundy, and others, there being descriptions of several new species, a continued paper on the birds of the eastern part of the Azov Sea (by Alphéraky), a revision of the Nightingales of the genus *Philomela* Link (by Buturlin, with a summary in English), and reviews of current ornithological literature.

THE early appearance of Mr. M. A. Carriker's work on the Birds of Costa Rica, left by him in manuscript, on his departure last summer for South America, for publication by the Carnegie Museum of Pittsburgh, is now assured, the matter being in type and ready for printing.

A NEW work, soon to appear in twelve sections, is announced by T. C. and E. C. Jack, of London and Edinburgh, entitled "The British Bird Book, an account of the birds, nests and eggs found in the British Isles," under the editorship of F. B. Kirkman, with "200 plates in color and many in monochrome." The authors include a number of well known authorities on British birds, and among the artists are H. Grönvold, A. W. Seaby, and G. E. Lodge, while photographs will also be freely used in illustration. With the profusion of books on British birds, it would seem that the field is already well covered, but there appears to be still room for another if of the exhaustive character here promised. One of the principal objects in

view is a detailed consideration of the *habits* of the species, and in making clear how little is really known in this respect, to "point the way to further research." The subscription price is 10s. 6d. net per section, with also an edition de luxe at 21s. per section; the London address of the publishers is 16 Henrietta Street, W. C.

ANOTHER work on British birds is also announced by Witherby and Co., the well-known natural history publishers of London. This belongs to the series of county histories, and is entitled 'The Birds of Dumfriesshire,' by Hugh S. Gladstone, "with twenty-four full-page plates from photographs of typical haunts and notable birds," and a contour map of the county in colors, showing altitude. This will be a volume in demy 8vo of about 600 pages. The edition will be limited to 350 numbered copies, and the subscription price is £1 1s. net. The work promises to be fairly exhaustive in point of treatment, and a valuable addition to the list of county avifaunas.

THE New York plumage bill, known as the 'Shea-White Plumage Bill,' passed the legislature of this State at its last session and was signed by Governor Hughes on May 7, 1910. The long-fought contest, waged for four years, by the Audubon Societies and friends of bird protection against the millinery interests of New York City has thus finally resulted in a victory for bird protection, and the precedent thus established we trust will be followed by other States. Some of the special provisions thus enacted are: "No part of the plumage, skin or body of any bird protected by this section [Sec. 98], or of any birds coming from without the State, whether belonging to the same or a different species from that native to the State of New York, provided such birds belong to the same family as those protected by this chapter, shall be sold or had in possession for sale. . . . Plumage includes any part of the feathers, head, wings or tail of any bird, and wherever the word occurs in this chapter reference is had equally to plumage of birds coming from without the State, but it shall not be constructed to apply to the feathers of birds of paradise, ostriches, domestic fowl or domestic pigeons. This act shall take effect July 1, 1911."

By this act, therefore, aigrettes cannot be legally sold in the State of New York after it becomes operative. The deferred date of its operation is perhaps a reasonable concession to the milliners to enable them to dispose of their present stock without serious loss.

The act thus protects not only egrets and other plume-bearing herons, but gulls, terns, albatrosses, eagles, vultures, and other birds slaughtered for their wings or quills, as well as all song and insectivorous birds.

The passage of the bill is the crowning reward of the persistent and widespread campaign of education conducted by the associated Audubon Societies under the direction of the President of the National Association and his immediate official staff.

It is announced that Mrs. Russell Sage has contributed the sum of \$15,000 to the National Association of Audubon Societies, to be expended during the next three years for bird protection, preferably in the Southern States. The fund is otherwise unrestricted and the first annual installment of \$5,000 is already available.